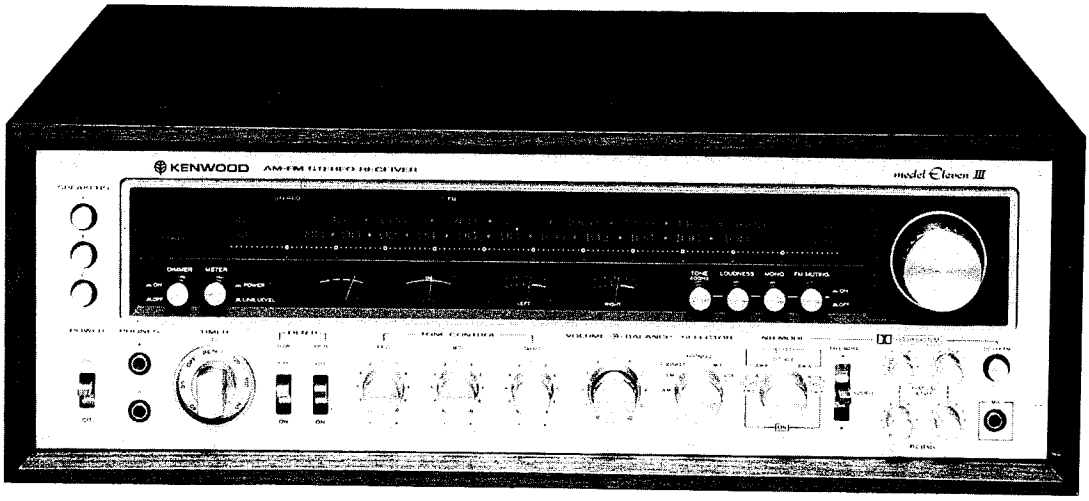
KENWOOD

HI/FI STEREO COMPONENTS

SERVICE MANUAL

MODEL ELEVEN III
(KR-10000III)



AM-FM STEREO RECEIVER

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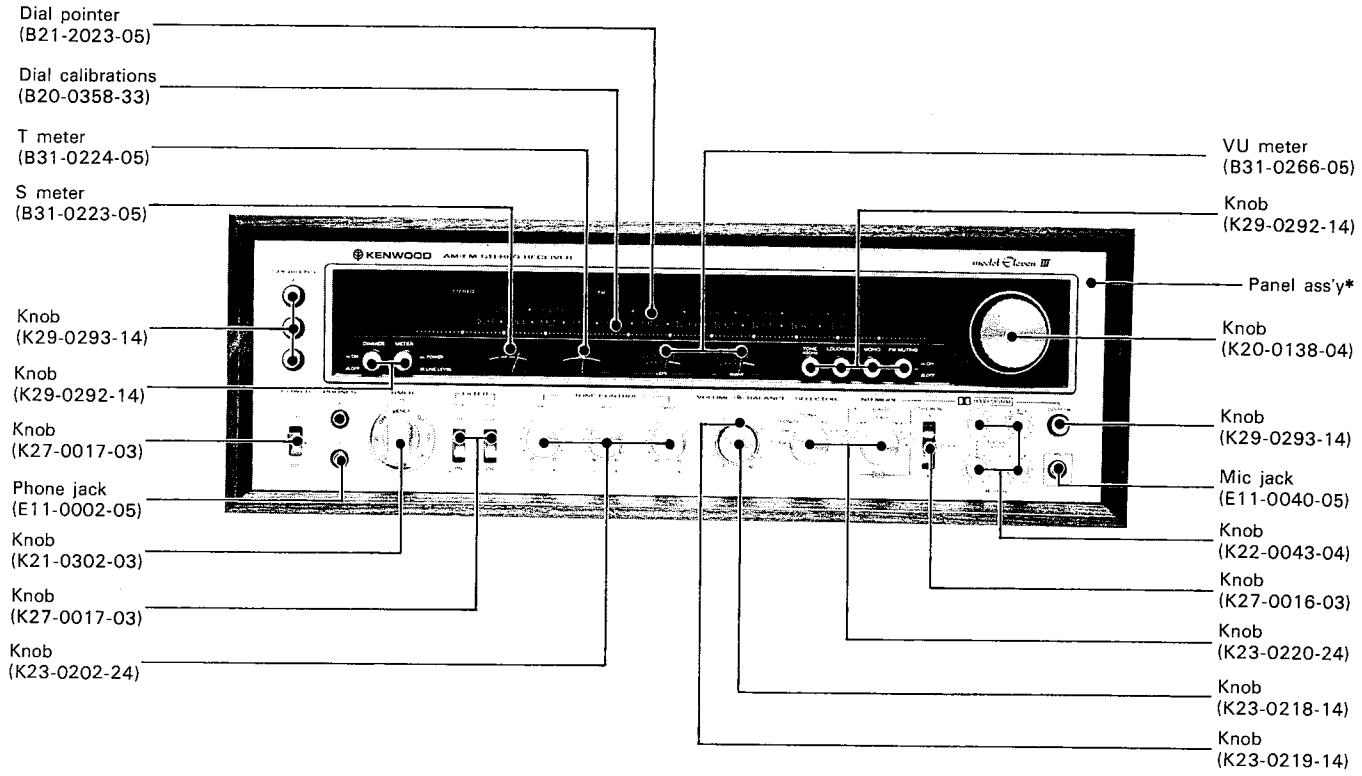
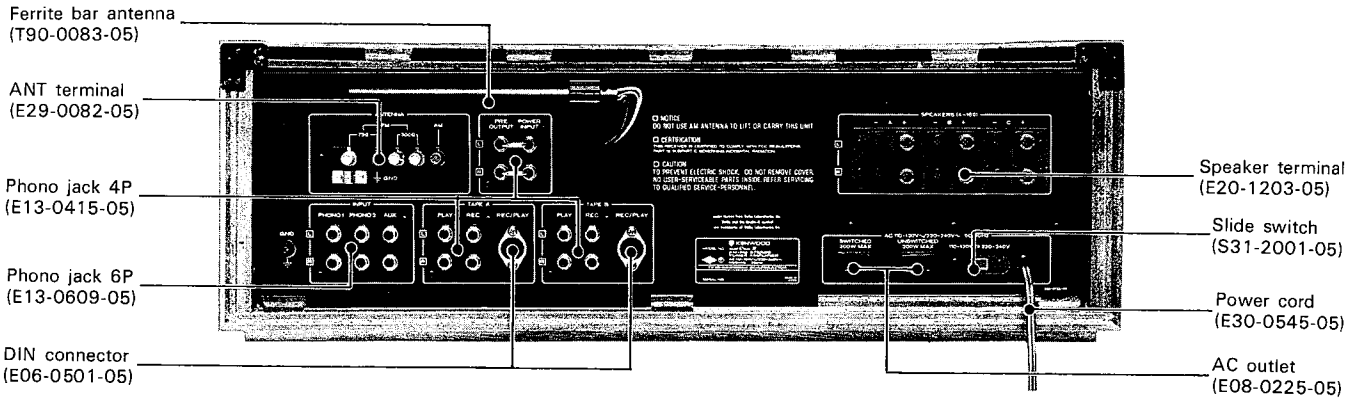
Dolby and the double-D symbol are the trade mark of Dolby Laboratories Inc.

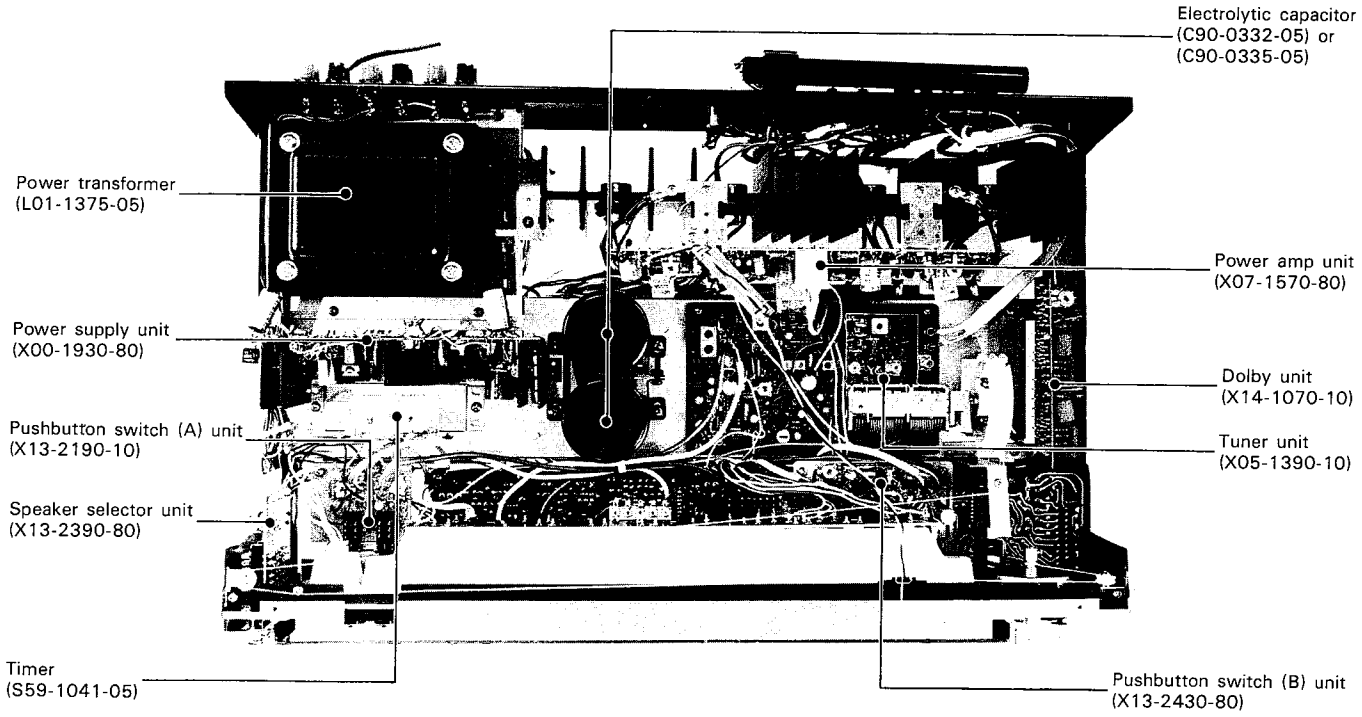
EXTERNAL VIEW

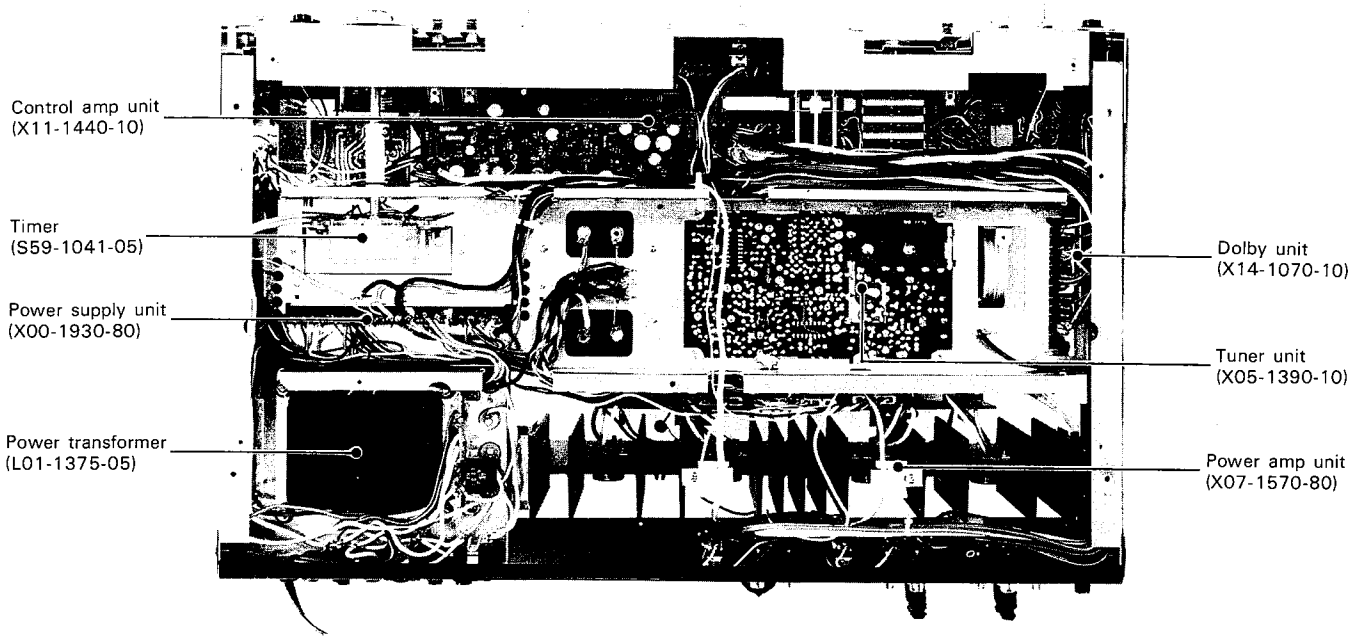




*Refer to Parts List.

INTERNAL VIEW

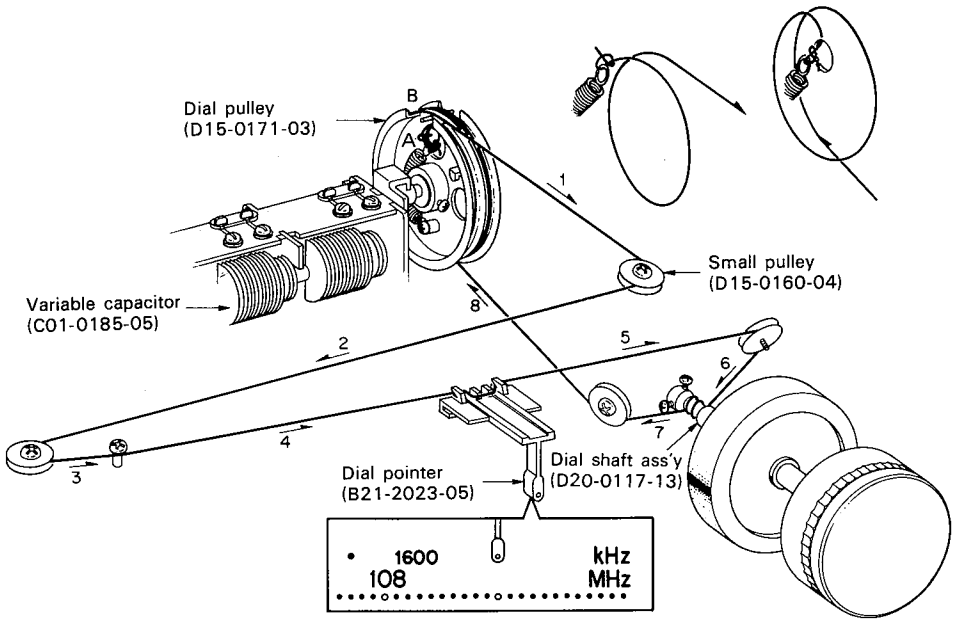




DIAL CORD STRINGING/DISASSEMBLY FOR REPAIR

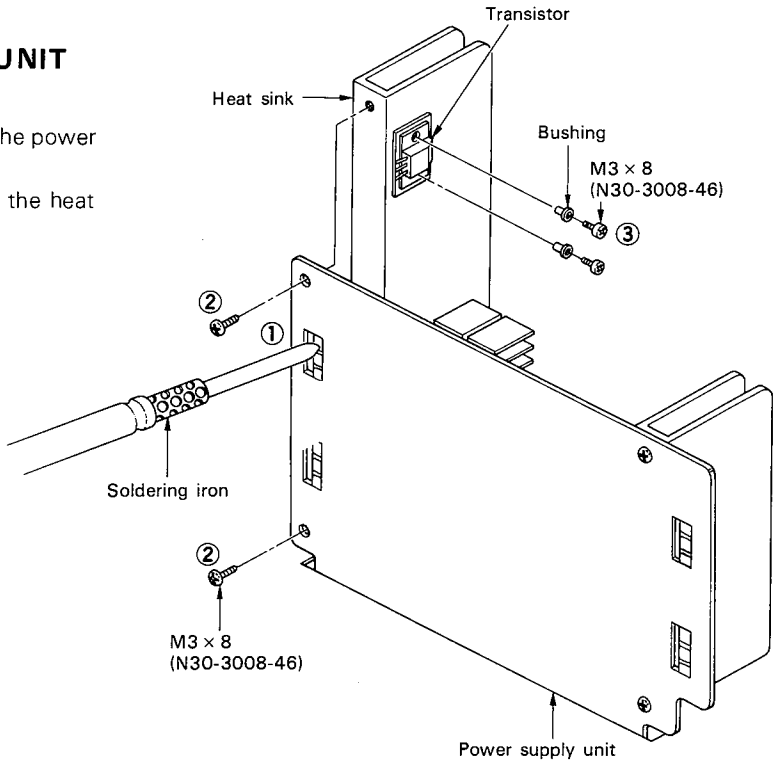
DIAL CORD STRINGING

1. Fully open the variable capacitor.
2. Fix the dial pulley to the shaft of the variable capacitor using the two screws as shown.
3. Tie the dial cord to the dial spring A leaving a 10 cm length part of it.
4. Fook the dial spring A on the boss B and wind it 1 turn clockwise around the dial pulley.
5. Dress the dial cord in the direction of "1" through "6".
6. Wind the dial cord 2 turns around the dial shaft starting from its lower side, then dress it in the direction of "7" to "8".
7. Wind the dial cord one and a half turns around the dial pulley starting from its lower side and tie the end of it tightly with remaining a 10 cm dial cord.
8. Remove the dial spring A from the boss B.
9. Mount the dial pointer as shown in the illustration.



TRANSISTORS OF POWER SUPPLY UNIT

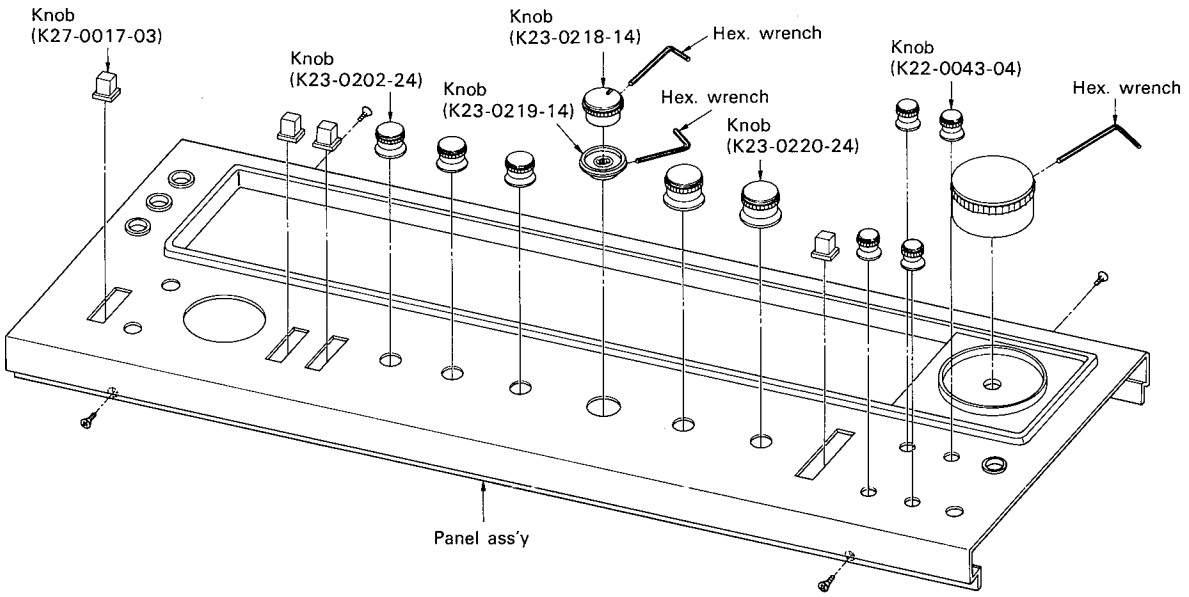
1. Unsolder the transistor's lead. ①
2. Remove the two screws fixing the heat sink to the power supply unit. ②
3. Remove the two screws fixing the transistor to the heat sink. ③



DISASSEMBLY FOR REPAIR

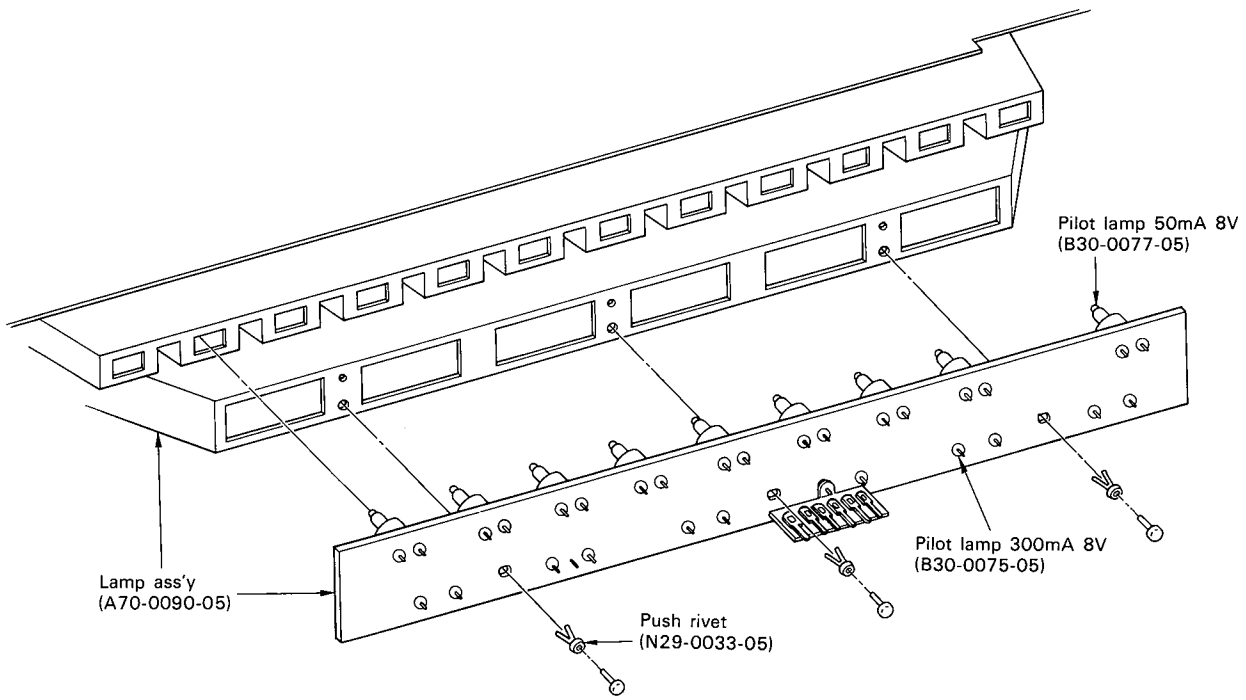
PANEL ASS'Y

1. Remove the screws fixing the panel to the chassis.
2. Pull out the knobs from the shafts, if necessary, using the hex. wrench.



LAMP ASS'Y

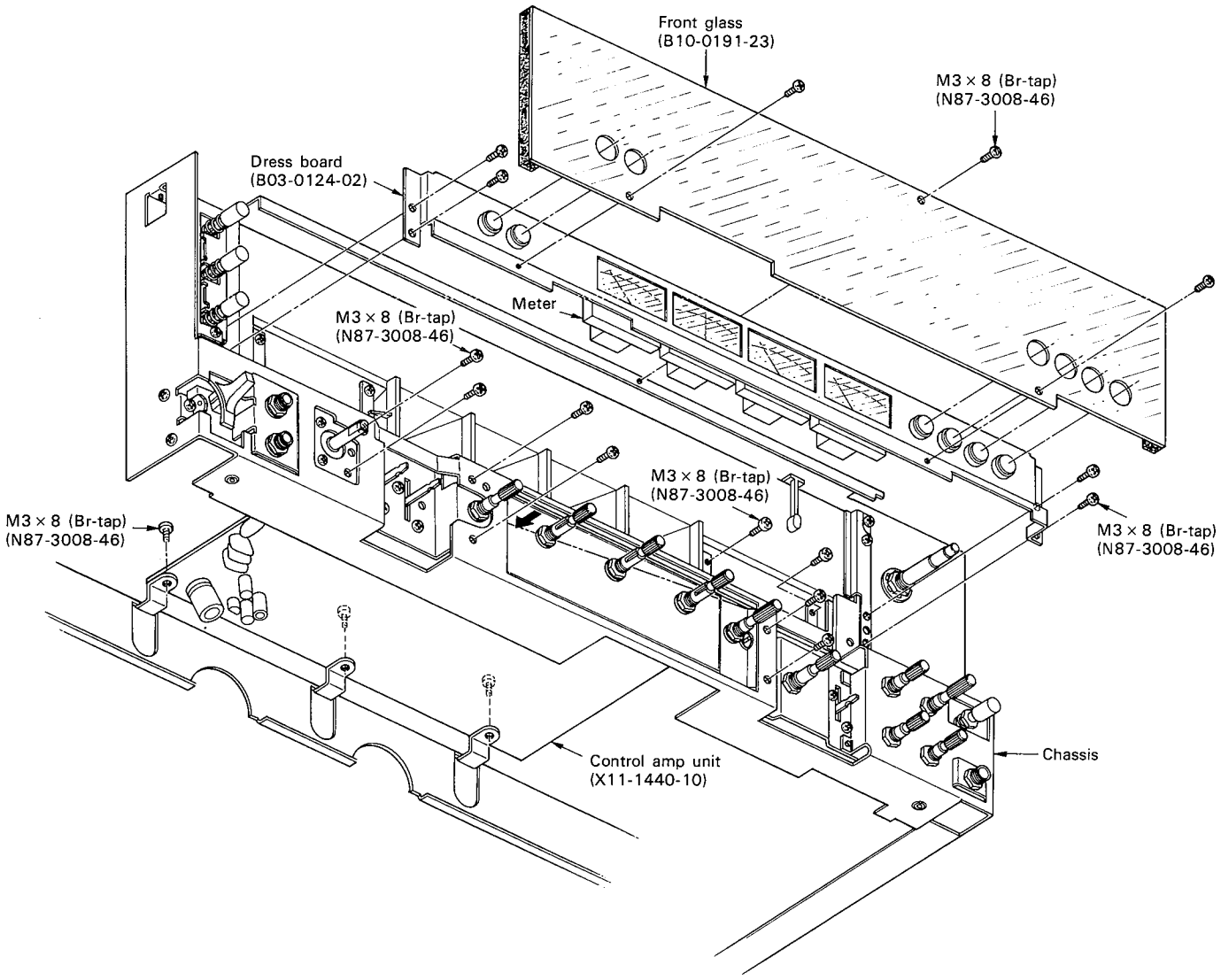
1. Disassemble the lamp ass'y by pulling out the push rivets.
2. Pilot lamp can be replaced.



DISASSEMBLY FOR REPAIR

CONTROL AMP UNIT

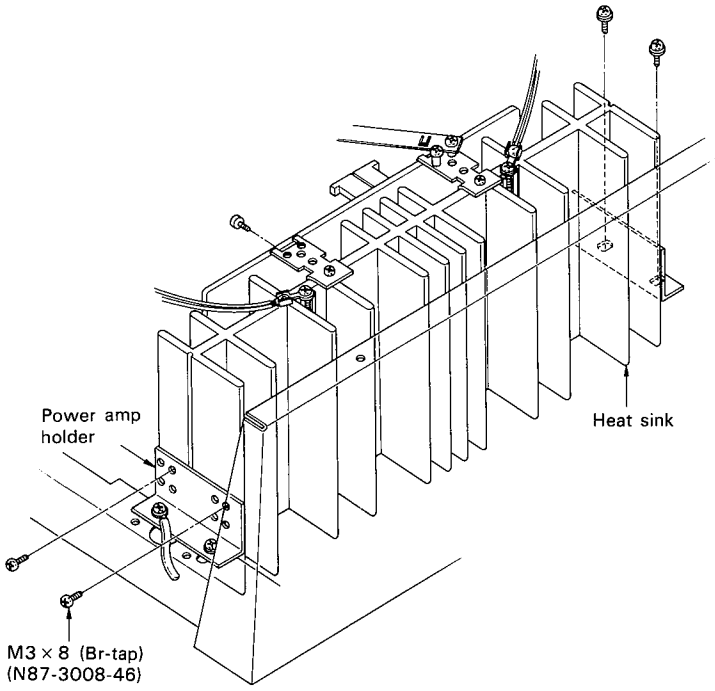
1. Remove the screws fixing the control amp unit to the chassis.
2. Push the control unit according as a black allow.
3. The control amp unit can be repaired.



DISASSEMBLY FOR REPAIR

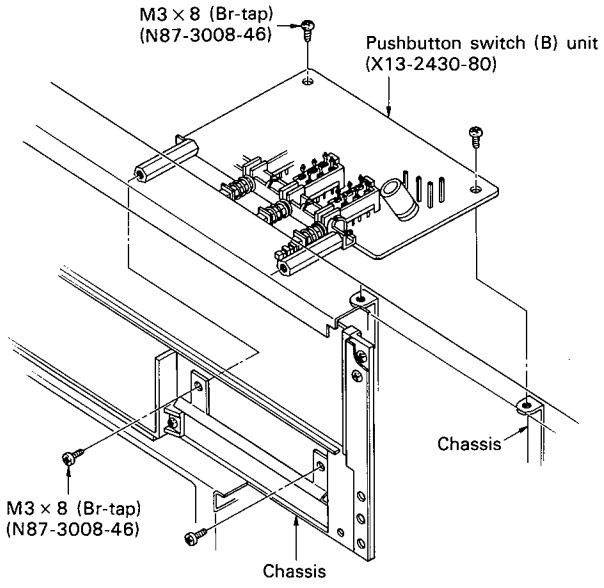
POWER AMP UNIT

1. Remove the screws fixing the heat sink to the chassis.
2. The power amp unit can be pulled up.

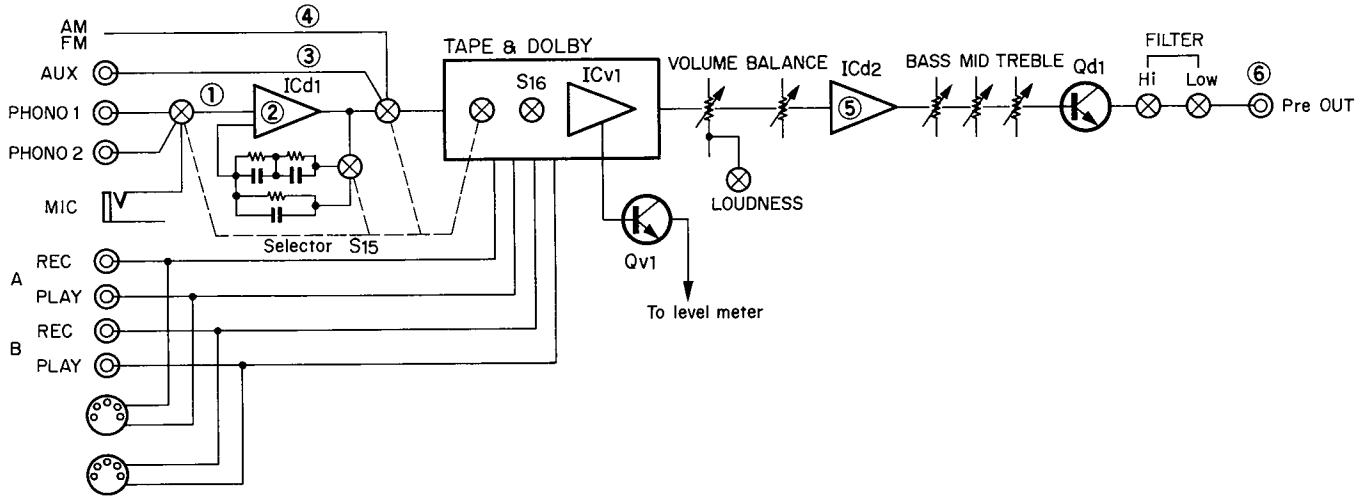


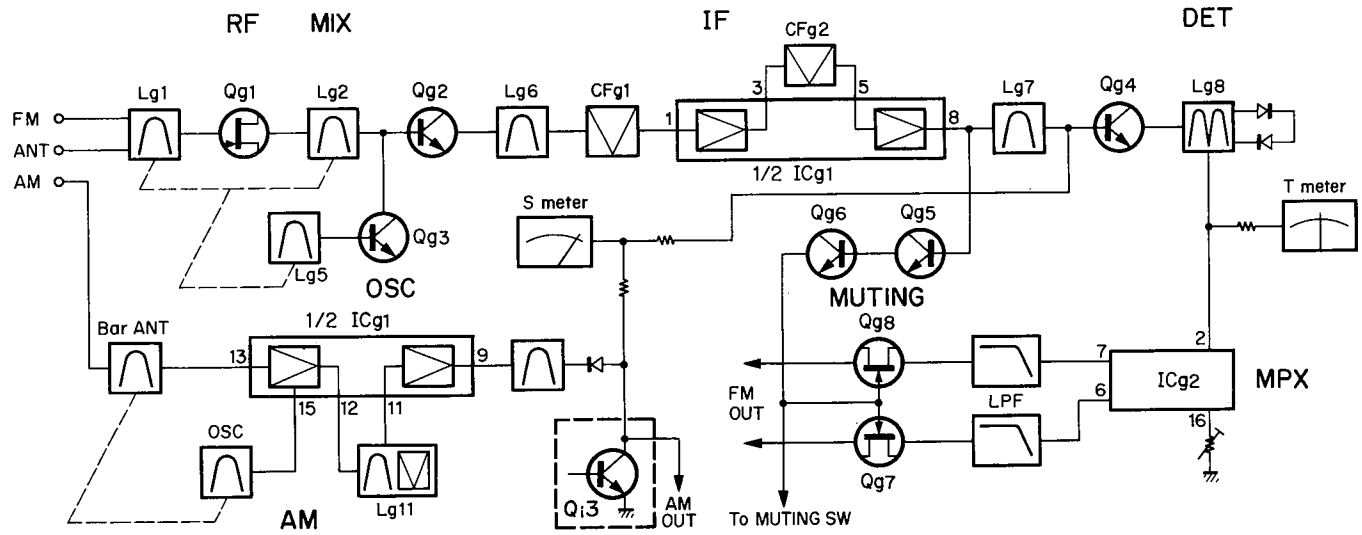
PUSH SWITCH (B) UNIT

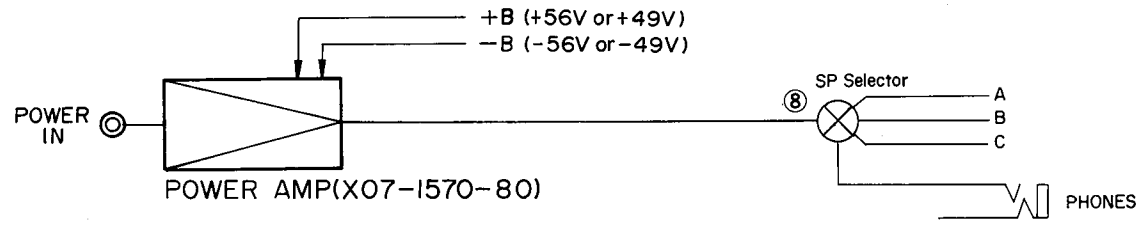
1. Remove the screws fixing the pushbutton switch (B) unit to the chassis.
2. The pushbutton switch (B) unit can be pulled up.



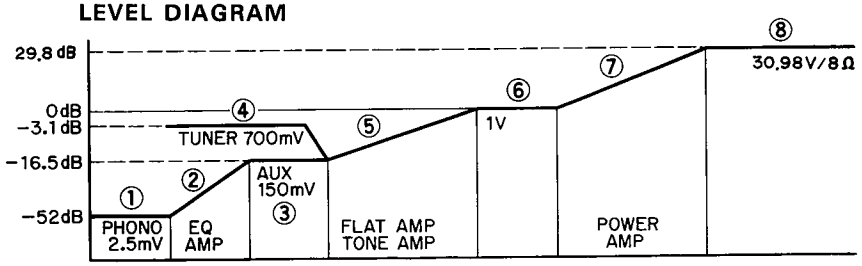
BLOCK DIAGRAM/LEVEL DIAGRAM







LEVEL DIAGRAM



CIRCUIT DESCRIPTION

GENERAL

The Model Eleven III is a modification of the Model Eleven II. The principal point of the modification is found in the output circuit which delivers a higher output power as shown below.

Model \ Output*	Load 8Ω	Load 4Ω
Model Eleven II	80W	110W～120W
Model Eleven III	120W	120W～130W

* Output: at 20 Hz to 20,000 Hz

In the Model Eleven III, the output power has been increased to 120W at 8Ω load impedance, while that at 4Ω load impedance remains almost the same. Although it is possible for the Model Eleven III to deliver 1.3 to 1.4 times (theoretically 2 times) the output at 8Ω, if it is driven with 4Ω load impedance. In this case, the output power will be increased to 156～168W. However, this requires higher grade transistors and large sized heat sinks which would reflect on the cost.

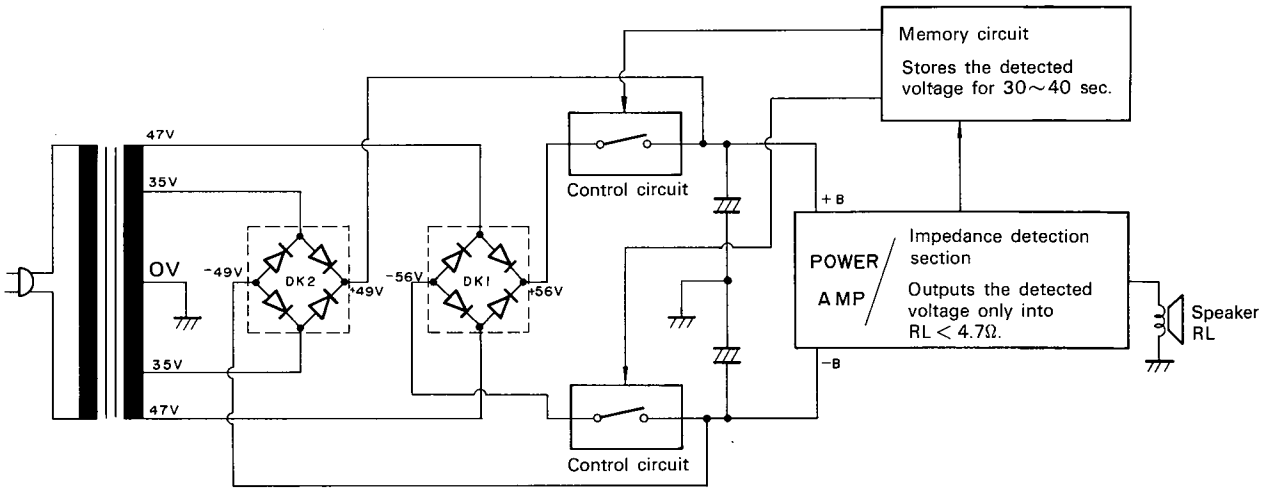
The Model Eleven III has a provision for detecting the impedance of speaker so that the maximum output at 8Ω or 4Ω impedance can be obtained by changing the taps of the power transformer and minimizing the difference of thermal loss caused by the load impedance.

PRINCIPLES OF OPERATION

1. The impedance detecting circuit is contained in the power amplifier section. It detects the impedance RL of speaker and produces an output voltage when RL is below 4.7Ω.
2. When RL is 8Ω, no output voltage is produced and the control circuit connected to the high voltage side of the power transformer turns to ON, thus the power is supplied from the high voltage tap of the transformer. The power voltage is stabilized by the voltage regulating circuit in the control circuit.
3. When RL is 4Ω, the output voltage of the detecting circuit is fed to the memory circuit, turning off the control circuit for 30 to 40 seconds to step down the tap of the power transformer.
4. The control circuit being OFF turns to ON again when the output of the power amplifier is increased, and the power is supplied from the high voltage tap of the transformer so that the variation of the power voltage can be minimized. This increases the output power at 4Ω load impedance.

As described above, the impedance detecting circuit selects the tap of the power transformer by detecting the speaker impedance, minimizing the voltage variation with resultant reduction of Pc of transistors to deliver a maximum output at 4Ω or 8Ω impedance.

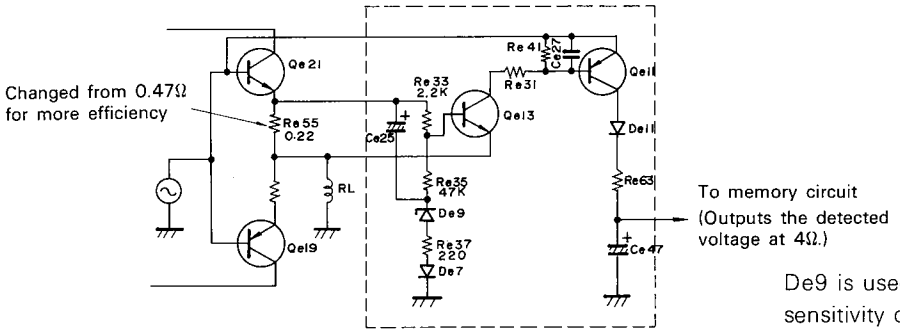
Since the transformer tap is selected according to the level of the output during the operation at 4Ω impedance, the power transformer can be designed in a small size.



CIRCUIT DESCRIPTION

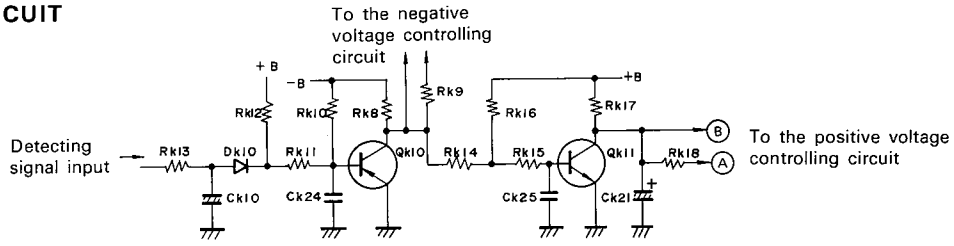
SPEAKER IMPEDANCE DETECTING CIRCUIT

This circuit is a Wheatstone bridge type consisting of Re55 0.22Ω, Re33 2.2kΩ, Re35 47kΩ and speaker impedance(RL). When RL is larger than 4.7Ω, most of the current in the final transistors flows into RL and hence Qe13 turns to OFF. In contrast with this, when RL is smaller than 4.7Ω, most of the current in the final transistors flows into Re33 and Re35, turning Qe13 and Qe11 to ON; at this time, DC voltage is fed to the memory circuit through Re63.



De9 is used to increase the sensitivity of the bridge circuit.

MEMORY CIRCUIT



This circuit functions to store the input from the detecting circuit for 30 to 40 seconds and then feed it to the plus and minus control circuits.

When the input is absent, Qk10 and Qk11 are ON in which each collector is held at about earth voltage. When the output of the detecting circuit is applied, Ck10 is charged (plus) where Qk10 and Qk11 are reversely biased simultaneously to set in OFF state. This condition is held until Ck10 is discharged through Rk10 and Rk11.

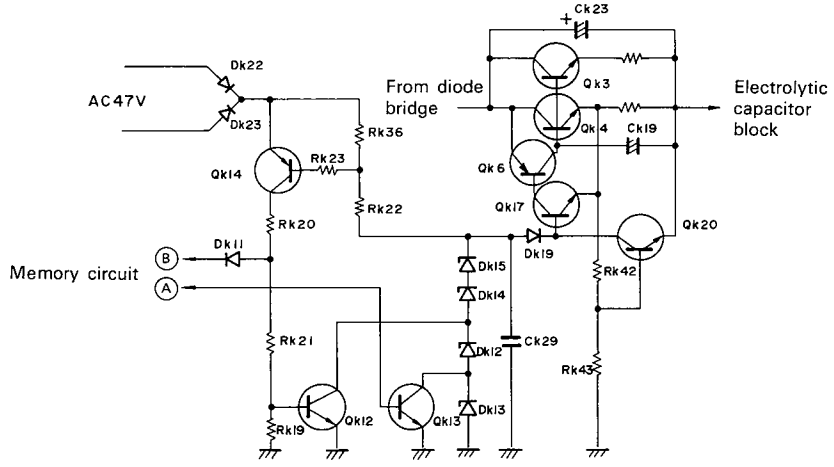
CONTROL CIRCUIT

The detection output from the memory circuit Ⓐ controls the base of Qk13 to turn on and off Qk3. When the load impedance RL is 8Ω, the voltage potential at the memory circuit Ⓐ is low and Qk13 is OFF, thus the control circuit functions at the reference voltage 56.1V (Dk12 ~ 15: $14.7 \times 3 + 12 = 56.1$).

When the load impedance is 4Ω, the voltage potential of the memory circuit Ⓐ is high and Qk13 turns to ON where Dk13 is shorted and the reference voltage becomes 44.1V (Dk12, 14, 15: $14.7 \times 3 = 44.1$). Since this voltage is lower than 49V at the low voltage tap of the transformer, the control circuit turns to OFF.

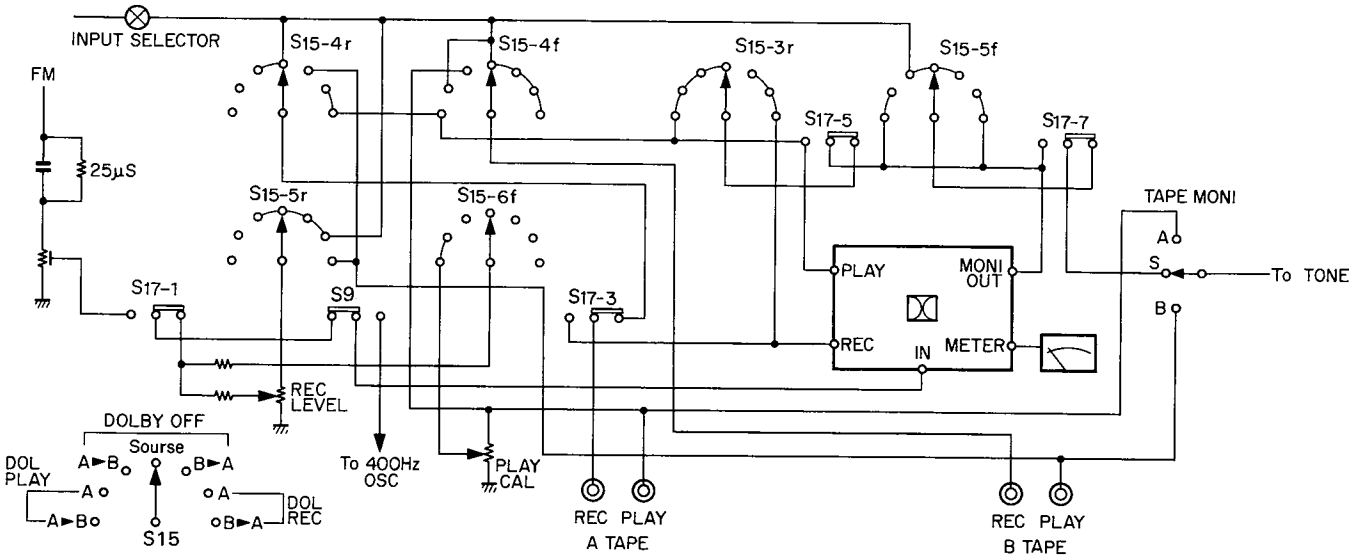
However, in the case where the power voltage is lowered, the control circuit turns to ON again to supply the power from the high voltage tap of the transformer, preventing the voltage drop. Qk20 is used for protection against overcurrent. It deenergizes the control circuit when the output current exceeds 8A.

Qk14 and Qk12 form a circuit to prevent the thermal loss. This circuit turns off the control circuit as the voltage between collector and emitter of the control transistor increases to a certain level.



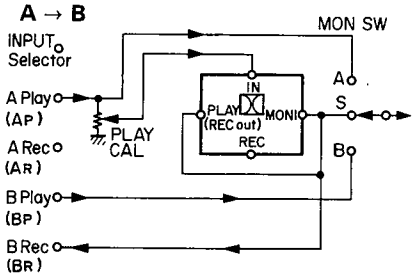
CIRCUIT DESCRIPTONS

DOLBY NR CIRCUIT CONNECTION DIAGRAM SELECTED BY S15.



① DOLBY on

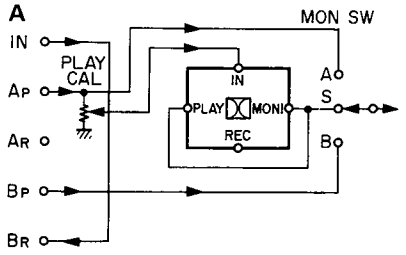
A → B



- Dolbyized signal from AP is decoded and fed to BR.
- No output at AR

② DOLBY ON

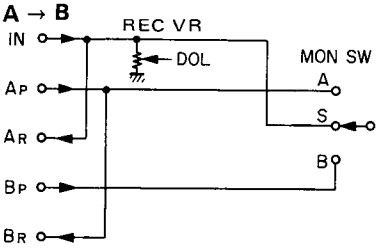
A



- Dolbyized signal from AP is decoded.
- No output at AR.
- The signal selected by INPUT SELECTOR comes out at BR.

③ DOLBY off

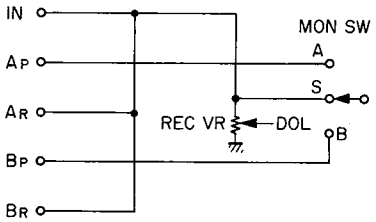
A → B



- Dubbing (AP → BR)
- DOL operation is only VU meter.

④ DOLBY off

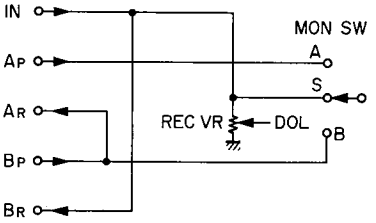
SOURCE



- Normal TAPE circuit
- DOL operation is only VU meter.

⑤ DOLBY off

B → A

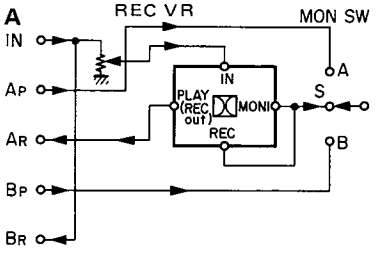


- Dubbing (BP → AR)
- DOL operation is only VU meter.

DOLBY on

REC

A

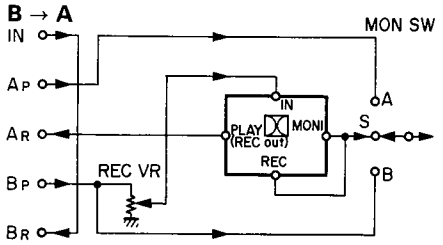


- Signal from INPUT SELECTOR is dolbyized and fed to AR.
- The signal at BR is not dolbyized.
- When MON SW is at S position, non-dolbyized signal comes out from the circuit.

⑦ DOLBY on

REC

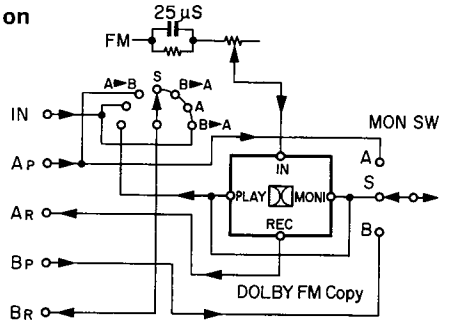
B → A



- Signal from BP is dolbyized and fed to AR.
- Signal from INPUT SELECTOR comes out at BR.
- When MON SW is S position, signal from BP comes out from the circuit.

⑧ DOLBY FM SW

on



- The circuit is for DOLBY FM reproduction.
- DOLBY FM copy signal comes out at AR.

	Signal at BR
DOLBY ON A→B	FM dolbyized signal
DOLBY OFF A→B	Input signal of AP
OTHER POSITION	Signal selected by INPUT SELECTOR except AM

PARTS LIST

MODEL ELEVEN III: U-type (PX), M-type (Other area)
KR-10000 III: M_2-type (Audio club)

TOTAL

☆ : New parts

Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
C2～5	CK45F1H103Z	Ceramic 0.01μF +80%−20%	
		SWITCH	
S3	S31-2001-05	Slide, POWER VOLTAGE SELECTOR	
		MISCELLANEOUS	
—	A03-0227-02	Cabinet	☆
—	A20-1181-03	Panel ass'y	☆ U,M
—	A20-1183-03	Panel ass'y	☆ M_2
—	B03-0124-02	Dress board	
—	B07-0111-04	Push switch ring × 4	
—	B07-0154-25	Escutcheon	
—	B07-0200-03	Multi-switch ring, four switches	
—	B07-0201-03	Multi-switch ring, two switches	
—	B07-0216-04	Ring	☆
—	B10-0191-23	Front glass	
—	B20-0358-33	Dial calibrations	
—	B21-2023-05	Dial pointer (LED)	
—	B31-0223-05	S meter	
—	B31-0224-05	T meter	
—	B31-0266-05	VU meter × 2	☆
—	B42-0009-04	Passed sticker	
—	B46-0051-00	Warranty card	U
—	B46-0062-10	Warranty card	U
—	B50-1644-00	Instruction manual	☆ U,M
—	B50-1646-00	Instruction manual	☆ M_2
—	B59-0018-00	Kenwood service stations' list	
—	D15-0171-13	Dial pulley	
—	D19-0050-14	Holding plate × 6	
—	D32-0075-04	Switch stopper	
—	E06-0501-05	DIN connector × 2	
—	E08-0225-05	AC outlet × 2	
—	E13-0415-05	Phono jack 4P (TAPE A, B, PRE⇔POWER) × 3	
—	E13-0609-05	Phono jack 6P (INPUT)	
—	E14-0107-05	Short-circuit pin plug × 2	
—	E20-1203-05	Speaker terminal board 12P	
—	E22-0421-05	Lug-type terminal strip (040)	
—	E29-0082-05	Antenna terminal board 4P	
—	E30-0222-05	Feeder cord with terminal	
—	E31-0061-05	Mini-connector ass'y 6P with protector against reverse connection for speaker	
—	E31-0104-05	Mini-connector ass'y 3P for power amp input	☆
—	E31-0105-05	Mini-connector ass'y 4P for power amp (L)	☆
—	E31-0106-05	Mini-connector ass'y 4P for power amp (R)	☆
—	E31-0107-05	Mini-connector ass'y 4P for relay A	☆
—	E31-0108-05	Mini-connector ass'y 3P for relay B	☆
—	E31-0113-05	Mini-connector ass'y for speaker	☆
F1,2	F05-3523-05	Fuse 3.5A	
—	G01-0045-24	Dial spring	
—	G01-0312-04	Spring for push sw knob × 6	
—	G01-0356-04	Spring for dial pointer	
—	H01-1728-04	Carton case	☆ U
—	H01-1729-04	Carton case	☆ M
—	H01-1730-04	Carton case	☆ M_2
—	H10-1478-02	Polystyrene foamed fixture × 2	
—	H20-0373-14	Polyethylene cover	U,M_2
—	H20-0429-04	Polyethylene cover	M
—	H25-0029-04	Polyethylene bag	
—	H25-0078-00	Instruction bag	
—	H40-0004-04	Anti-rust paper	
—	J12-0010-04	Short-circuit pin (18 mm) × 2	
—	J13-0040-05	Fuse holder × 2	
—	J19-0306-05	Lead holder	
—	J19-0507-05	Antenna holder	
—	J30-0028-04	PC board holder × 2	
—	J41-0034-05	Power cord bushing	
—	J42-0075-04	Small bushing for dial pointer	
—	K20-0138-04	Knob (TUNING)	
—	K21-0302-03	Knob (TIMER)	
—	K22-0043-04	Knob (DOLBY VOLUME) × 4	
—	K23-0202-24	Knob (TONE) × 3	
—	K23-0218-14	Knob (VOLUME)	
—	K23-0219-14	Knob (BALANCE)	
—	K23-0220-24	Knob (SELECTOR) × 2	
—	K27-0016-03	Knob (TAPE MON)	
—	K27-0017-03	Knob (POWER, FILTER) × 3	
—	K29-0292-14	Knob (PUSH φ12) × 6	
—	K29-0293-14	Knob (PUSH φ11) × 4	
—	L01-1375-05	Power transformer	☆
—	N08-0128-25	GND screw	
CR1	R90-0097-05	Spark killer 0.1μF + 120Ω	
—	T90-0083-05	Ferrite bar antenna	
—	T90-0202-05	FM indoor antenna	
—	X07-1570-80	Power amp unit	☆
—	X13-2390-80	Speaker selector unit	
—	X90-1350-80	Tuner ass'y	☆
—	351-0003-14	Dial string	

TUNER ASS'Y (X90-1350-80)

Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
C1	C91-0023-05	Ceramic 0.01μF 250WV	
C6,7	C90-0332-05 or C90-0335-05	Pair-electrolytic 12000μF 63WV	

PARTS LIST

Ref. No.	Parts No.	Description	Remarks
		POTENTIOMETER	
VR1～4	R01-5013-05	Variable resistor 100kΩ(A) REC LEVEL, PLAY CAL	
		SWITCH	
S1	S59-1041-05	Timer	
S2	S37-2002-15	Lever (POWER)	
		MISCELLANEOUS	
—	A30-0103-15	Dial board	
—	A70-0090-05	Lamp ass'y	
—	B30-0064-15	Pilot lamp 8V 50 mA × 3, INDICATION	
—	B30-0068-05	Pilot lamp 8V 200 mA × 4, METER	
—	D15-0160-04	Small pulley × 4	
—	D20-0117-03	Dial shaft ass'y	
—	D21-0436-03	Timer shaft	
—	D22-0032-04	Coupling	
—	E11-0002-05	Phono jack × 2	
—	E11-0040-05	Mic jack	
—	E22-0416-05	Lug-type terminal strip (202)	
—	J19-0306-05	Lead holder	
—	J42-0071-04	Small bushing	
—	J61-0023-05	Cord clip	
—	J61-0033-05	Cord clip × 2	
—	J90-0073-03	Dial pointer rail	
—	X00-1930-80	Power supply unit	☆
—	X05-1390-10	Tuner unit	
—	X11-1440-10	Control amp unit	☆
—	X13-2190-10	Pushbutton switch (A) unit	
—	X13-2310-10	Tape monitor unit	
—	X13-2430-80	Pushbutton switch (B) unit	
—	X14-1070-10	Dolby unit	

POWER SUPPLY (X00-1930-80)

Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
Ck1～8	CK45E2H103P	Ceramic 0.01μF +100%−0%	
Ck9	CE04W1K331	Electrolytic 330μF 80WV	
Ck10	CE04W1J101	Electrolytic 100μF 63WV	
Ck11	CE04W1H221	Electrolytic 220μF 50WV	
Ck12	CE04W1C101	Electrolytic 100μF 16WV	
Ck13	CE04W1H010	Electrolytic 1μF 50WV	
Ck14	CE04W1V221	Electrolytic 220μF 35WV	
Ck15	CE04W1H010	Electrolytic 1μF 50WV	
Ck16	CK45H1F473Z	Ceramic 0.047μF +80%−20%	
Ck17	CE04W1A222	Electrolytic 2200μF 10WV	
Ck18,19	CE04W1C470	Electrolytic 47μF 16WV	
Ck21	CE04W1H010	Electrolytic 1μF 50WV	
Ck22,23	CE04W1J470	Electrolytic 47μF 63WV	
Ck24,25	CK45F1H103Z	Ceramic 0.01μF +80%−20%	
Ck26～29	CK45E2H103P	Ceramic 0.01μF +100%−0%	

Ref. No.	Parts No.	Description	Remarks
		RESISTOR	
Rk6,7	R92-0166-05	Metal plate 0.22Ω ±5% 1W	
Rk13	RD14GY2E681J	Flame-proof carbon 680Ω ±5% 1/4W	
Rk24	RS14GB3D471J	Flame-proof metal film 470Ω ±5% 2W	
Rk25	RC05GF2H182K	Carbon 1.8kΩ ±10% 1/2W	
Rk26	RC05GF2H561K	Carbon 560Ω ±10% 1/2W	
Rk28	RS14GB3A271J	Flame-proof metal film 270Ω ±5% 1W	
Rk29	RS14GB3D301J	Flame-proof metal film 300Ω ±5% 2W	
Rk32,33	R92-0111-05	Metal plate 0.47Ω ±5% 3W	
Rk35	RC05GF2H391K	Carbon 390Ω ±10% 1/2W	
Rk37,38 44～47	R92-0166-05	Metal plate 0.22Ω ±5% 1W	
		SEMICONDUCTOR	
Qk1,2	V02-0060-05	Transistor 2SB616(Q),(R) or (S)	
Qk3,4	V04-0079-05	Transistor 2SD586(Q),(R) or (S)	
Qk5	V01-0893-10	Transistor 2SA893 (D), (E) or (F)	
	V01-0152-05	or 2SA750(I) (E) or (U)	
Qk6	V02-0569-10	Transistor 2SB596(R),(O) or (Y)	
Qk7	V03-1890-10	Transistor 2SC1890(D),(E) or (F)	
	V03-0424-05	or 2SC1400(E) or (U)	
Qk8,9	V01-0084-05	Transistor 2SA733(Q) or (R)	
	V01-0163-05	or 2SA564A(Q) or (R)	
Qk10	V01-0893-10	Transistor 2SA893(D),(E) or (F)	
	V01-0152-05	or 2SA750(I) (E) or (U)	
Qk11	V03-1890-10	Transistor 2SC1890(D),(E) or (F)	
	V03-0424-05	or 2SC1400(E) or (U)	
Qk12,13	V03-0270-05	Transistor 2SC945(Q) or (R)	
	V03-0504-05	or 2SC828A(Q) or (R)	
Qk14	V01-0893-10	Transistor 2SA893(D), (E) or (F)	
	V01-0152-05	or 2SA750(I) (E) or (U)	
Qk15	V04-0330-10	Transistor 2SD330(D),(E) or (F)	
	V03-0343-05	or 2SC1419(B) or (C)	
Qk16,17	V03-1890-10	Transistor 2SC1890(D),(E) or (F)	
	V03-0424-05	or 2SC1400(E) or (U)	
Qk18	V04-0526-10	Transistor 2SD526(R),(O) or (Y)	
Qk19	V01-0893-10	Transistor 2SA893(D),(E) or (F)	
	V01-0152-05	or 2SA750(I) (E) or (U)	
Qk20	V03-1890-10	Transistor 2SC1890(D),(E) or (F)	
	V03-0424-05	or 2SC1400(E) or (U)	
Dk1,2	V11-0415-05	Diode M4C-5(S)	
Dk3	V11-0273-05	Diode 1S2076A	
Dk4	V11-4100-50	Zener diode XZ-147 14.7V, 500mW	☆
Dk5	V11-0273-05	Diode 1S2076A	
Dk6,7	V11-4100-50	Zener diode XZ-147 14.7V, 500 mW	☆
Dk8	V11-0249-05	Zener diode WZ-120 12V, 500 mW	
Dk9	V11-0295-05	Diode W06B	
Dk10,11	V11-0273-05	Diode 1S2076A	
Dk12	V11-4100-50	Zener diode XZ-147 14.7V, 500 mW	☆
Dk13	V11-0249-05	Zener diode WZ-120 12V, 500 mW	
Dk14,15	V11-4100-50	Zener diode XZ-147 14.7V, 500 mW	☆
Dk16	V11-0344-05	Zener diode WZ-140 14V, 500 mW	
Dk17	V11-0273-05	Diode 1S2076A	
Dk18	V11-0295-05	Diode W06B	
Dk19	V11-0273-05	Diode 1S2076A	
Dk20～23	V11-0200-05	Diode V06C	
		MISCELLANEOUS	
Fk1	F05-4022-05	Fuse 4A	
—	F20-0114-05	Mica plate × 4	

PARTS LIST

Ref. No.	Parts No.	Description	Re-marks
—	J13-0041-05	Fuse clip	

TUNER (X05-1390-10)

Ref. No.	Parts No.	Description	Re-marks
		CAPACITOR	
Cg1	CC45SL1H150K	Ceramic 15pF ±10%	
Cg2	CK45F1H103Z	Ceramic 0.01μF +80%−20%	
Cg3	CC45SL1H150K	Ceramic 15pF ±10%	
Cg4	CC45SL1H050D	Ceramic 5pF ±0.5pF	
Cg5	CC45TH1H020C	Ceramic 2pF ±0.25pF	
Cg6	CC45SL1H221K	Ceramic 220pF ±10%	
Cg7	CK45F1H223Z	Ceramic 0.022μF +80%−20%	
Cg8	CC45RG1H180K	Ceramic 18pF ±10%	
Cg9	CC45PG1H150K	Ceramic 15pF ±10%	
Cg10	CC45SH1H470K	Ceramic 47pF ±10%	
Cg11	CC45SH1H220K	Ceramic 22pF ±10%	
Cg12,13	CK45F1H223Z	Ceramic 0.022μF +80%−20%	
Cg14	CK45F1H103Z	Ceramic 0.01μF +80%−20%	
Cg15	CC45SL1H180K	Ceramic 18pF ±10%	
Cg16,17	CK45F1H223Z	Ceramic 0.022μF +80%−20%	
Cg18	CC45SL1H180K	Ceramic 18pF ±10%	
Cg19	CC45SL1H221K	Ceramic 220pF ±10%	
Cg20	CK45F1H223Z	Ceramic 0.022μF +80%−20%	
Cg21	CC45SL1H331K	Ceramic 330pF ±10%	
Cg22	CQ93M1H122M	Mylar 0.0012μF ±20%	
Cg23～25	CK45F1H223Z	Ceramic 0.022μF +80%−20%	
Cg26	CE04W1E100	Electrolytic 10μF 25WV	
Cg27,28	CC45SL1H331K	Ceramic 330pF ±10%	
Cg29	CC45SL1H221K	Ceramic 220pF ±10%	
Cg30	CE04W1C221	Electrolytic 220μF 16WV	
Cg41	CC45SL1H180K	Ceramic 18pF ±10%	
Cg42	CQ09S1H361J	Polysthyrene 360pF ±5%	
Cg43	CK45F1H223Z	Ceramic 0.022μF +80%−20%	
Cg44	CQ93M1H223M	Mylar 0.022μF ±20%	
Cg45	CQ93M1H103M	Mylar 0.01μF ±20%	
Cg46	CQ93M1H223M	Mylar 0.022μF ±20%	
Cg47	CK45F1H223Z	Ceramic 0.022μF +80%−20%	
Cg48,49	CE04W1H010	Electrolytic 1μF 50WV	
Cg50	C90-0269-05	Ceramic 1μF ±20%	
Cg51	CE04W0J221	Electrolytic 220μF 6.3WV	
Cg60	CK45F1H103Z	Ceramic 0.01μF +80%−20%	
Cg61	CQ93M1H122M	Mylar 0.0012μF ±20%	
Cg62	CE04W1C221	Electrolytic 220μF 16WV	
Cg63	CQ93M1H473M	Mylar 0.047μF ±20%	
Cg64	CQ09S1H361J	Polystyrene 360pF ±5%	
Cg65,66	CE04W1E100	Electrolytic 10μF 25WV	
Cg67	CS15E1E1R5M	Tantalum 1.5μF 25WV	
Cg68	CS15E1E3R3M	Tantalum 3.3μF 25WV	
Cg69	CE04AW1HR33CC	Electrolytic 0.33μF 50WV	
Cg70,71	CQ93M1H152J	Mylar 0.0015μF ±5%	
Cg72	CE04W1C4R7	Electrolytic 4.7μF 16WV	
Cg75～78	CE04W1H3R3	Electrolytic 3.3μF 50WV	
Cg79	CE04W1E4R7	Electrolytic 4.7μF 25WV	
Cg80,81	CQ93M1H392J	Mylar 0.0039μF ±5%	
		SEMICONDUCTOR	
Qg1	V09-0071-05	FET 2SK55(D) or (E)	
Qg2	V03-0092-05	Transistor 2SC381(O)	
Qg3	V03-0357-05	Transistor 2SC1342(A)	
Qg4	V03-0091-05	Transistor 2SC381(R)	
Qg5,6	V03-0270-05	Transistor 2SC945	
Qg7,8	V09-0110-05	Transistor 2SK68(L) or (M)	
	V09-0058-05	or 2SK30A(Y) or (G)	
ICg1	V30-0093-05	IC AN217BB	
ICg2	V30-0155-05	IC HA1196	
Dg1～4	V11-0051-05	Diode 1N60	
Dg5,6	V11-0271-05	Diode 1S2076 or 1S1555	
Dg7	V11-4100-70	Zener diode XZ-137	
Dg8	V11-0051-05	Diode 1N60	
Dg9,12	V11-0271-05	Diode 1S2076 or 1S1555	
		COIL/TRANS/FILTER/INDUCTOR	
Lg1	L31-0361-05	FM ANT coil	
Lg2	L31-0359-05	FM RF coil	
Lg3	L40-1091-41	Ferri-inductor 1μH (K)	
Lg4	L40-1092-03	Ferri-inductor 1μH (M)	
Lg5	L32-0187-05	FM OSC coil	
Lg6	L30-0282-05	FM IFT	
Lg7	L30-0274-05	FM IFT	
Lg8	L30-0260-15	FM DISCRI coil	
Lg9	L40-1092-03	Ferri-inductor 1μH (M)	
Lg10	L32-0186-05	AM OSC coil	
Lg11	L72-0035-05	AM ceramic filter	
Lg12	L30-0283-05	AM DETECT coil	
Lg13	L40-1022-03	Ferri-inductor 1mH (M)	
Lg14	L79-0052-05	Low pass filter	☆
Lg15	L79-0053-05	Low pass filter	☆
CFg1,2	L72-0034-05	FM ceramic filter	
		POTENTIOMETER	
VRg1	R12-3030-05	Semi-fixed resistor 10kΩ VCO	
VRg2	R12-7006-05	Semi-fixed resistor 500kΩ	
	or R12-7007-05	SEPARATION	
		MISCELLANEOUS	
—	C01-0185-05	Variable capacitor	
CTg1	C05-0055-05	Ceramic trimmer	
CRg1	R90-0104-05	CR parts	

POWER AMP (X07-1570-80)

Ref. No.	Parts No.	Description	Re-marks
		CAPACITOR	
Ce1,2	CC45SL1H101K	Ceramic 100pF ±10%	
Ce3～6	CE04AW1E3R3M	Electrolytic 3.3μF 25WV	
Ce7,8	CE04W1A470	Electrolytic 47μF 10WV	
Ce9,10	CC45SL1H010D	Ceramic 1pF ±0.5pF	
Ce11,12	CE04W1H010	Electrolytic 1μF 50WV	
Ce13,14	CC45SL1H101K	Ceramic 100pF ±10%	
Ce15,16	CE04W1H470	Electrolytic 47μF 50WV	
Ce17,18	CC45SL1H180K	Ceramic 18pF ±10%	
Ce19,20	CE04W1A101	Electrolytic 100μF 10WV	
Ce21,22	CE04W2A470	Electrolytic 47μF 100WV	
Ce23,24	CE04W1J010	Electrolytic 1μF 63WV	
Ce25,26	CE04W1H010	Electrolytic 1μF 50WV	
Ce27,28	CQ93M1H104M	Mylar 0.1μF ±20%	
Ce29～32	CC45SL1H101K	Ceramic 100pF ±10%	
Ce41,42	CQ93M1H104M	Mylar 0.1μF ±20%	
Ce43	CE04BW1A470M	Non-pole electrolytic 47μF 10WV	

PARTS LIST

Ref. No.	Parts No.	Description	Remarks
Ce44	CE04AW1C470M	Electrolytic 47μF 16WV	
Ce45	CQ93M1H104M	Mylar 0.1μF ±20%	
Ce46	CK45F1H103Z	Ceramic 0.01μF +80%−20%	
Ce47	CE04W1J010	Electrolytic 1μF 63WV	
		RESISTOR	
Re15,16	RC05GF2H472K	Carbon 4.7kΩ ±10% 1/2W	
Re29,30 37,38	RD14GY2E221J	Flame-proof carbon 220Ω ±5% 1/4W	
Re39,40 43,44	RD14GY2E121J	Flame-proof carbon 120Ω ±5% 1/4W	
Re45,46	RC05GF2H222K	Carbon 2.2kΩ ±10% 1/2W	
Re47,48	RC05GF2H332K	Carbon 3.3kΩ ±10% 1/2W	
Re49～52	RD14GY2E181J	Flame-proof carbon 180Ω ±5% 1/4W	
Re53～56	R92-0167-05	Metal plate 0.22Ω ±5% 3W	☆
Re57,58	RD14GY2E181J	Flame-proof carbon 180Ω ±5% 1/4W	
Re59～62	RD14GY2E4R7J	Flame-proof carbon 4.7Ω ±5% 1/4W	
Re71,72	RS14GB3F100J	Flame-proof metal film 10Ω ±5% 3W	
Re76	RS14GB3D821J	Flame-proof metal film 820Ω ±5% 2W	
		SEMICONDUCTOR	
Qe1～4	V01-0191-05	Transistor 2SA872(D) or (E)	
Qe5,6	V03-0439-05	Transistor 2SC1885(D) or (R)	
Qe7,8	V03-1890-10	Transistor 2SC1890(D),(E) or (F)	
	V03-0447-05	or 2SC1681(GR) or (BL)	
Qe9,10	V03-1890-30	Transistor 2SC1890A(D),(E) or (F)	
Qe11,12	V01-0893-10	Transistor 2SA893(D),(E) or (F)	
	V01-0152-05	or 2SA750(I) (E) or (U)	
Qe13,14	V03-0270-05	Transistor 2SC945(Q) or (R)	
	V03-0504-05	or 2SC828A(Q) or (R)	
Qe15,16	V01-0188-05	Transistor 2SA913(Q) or (R)	
Qe17,18	V03-0468-05	Transistor 2SC1913(Q) or (R)	
Qe19,20	V01-0176-05	Transistor 2SA747(O) or (Y)	
Qe21,22	V03-0455-05	Transistor 2SC1116(O) or (Y)	
Qe23	V01-0084-05	Transistor 2SA733(Q) or (R)	
	V01-0163-05	or 2SA564A(D) or (R)	
Qe24,25	V03-0270-05	Transistor 2SC945(Q) or (R)	
	V03-0504-05	or 2SC828(Q) or (R)	
Qe26	V03-1890-10	Transistor 2SC1890(D),(E) or (F)	
	V03-0447-05	or 2SC1681(GR) or (BL)	
Qe27	V04-0438-10	Transistor 2SD438MP(D) or (E)	
	V03-0452-05	or 2SC1735(D) or (E)	
Qe28	V01-0893-10	Transistor 2SA893(D),(E) or (F)	
	V01-0152-05	or 2SA750(I) (E) or (U)	
De1,2	V11-4100-20	Zener diode WZ-300 30V	☆
De3,4	V11-0271-05	Diode 1S2076	
De5～8	V11-0273-05	Diode 1S2076A	
De9,10	V11-0344-05	Zener diode WZ-140 14V	
De11,12	V11-0273-05	Diode 1S2076A	
De13	V11-0295-05	Diode W06B	
De14	V11-0271-05	Diode 1S2076	
THe1,2	V22-0027-05	Thermistor 5TP-41L	
		POTENTIOMETER	
VRe1,2	R12-1007-05	Semi-fixed resistor 1kΩ BIAS	
		MISCELLANEOUS	
—	E02-0209-05	Transistor socket × 4	
—	E40-0380-05	Mini-connector ass'y 3P	
—	E40-0381-05	Mini-connector ass'y 3P (L-shaped, right)	☆
—	E40-0481-05	Mini-connector ass'y 4P (L-shaped, right)	☆
—	E40-0482-05	Mini-connector ass'y 4P (L-shaped, left) × 2	☆
—	F20-0066-05	Mica plate × 4	
Le1,2	L39-0080-15	Phase compensation coil	
—	S51-4030-05 or S51-4033-05	Relay	

CONTROL AMP (X11-1440-10)

Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
Ci1,2	CS15E1A3R3M	Tantalum 3.3μF 10WV	
Ci3,4	CE04W1A101	Electrolytic 100μF 10WV	
Ci5,6	CC45SL1H101K	Ceramic 100pF ±10%	
Ci7,8	CE04W1E100	Electrolytic 10μF 25WV	
Ci9,10	CQ93M1H822J	Mylar 0.0082μF ±5%	
Ci11,12	CQ93M1H272J	Mylar 0.0027μF ±5%	
Ci13,14	CK45B1H391K	Ceramic 390pF ±10%	
Ci15,16	CS15E1A3R3M	Tantalum 3.3μF 10WV	
Ci17,18	CE04W1A101	Electrolytic 100μF 10WV	
Ci19,20	CC45SL1H100D	Ceramic 10pF ±0.5pF	
Ci21,22	CE04W1E100	Electrolytic 10μF 25WV	
Ci23,24	CK45B1H391K	Ceramic 390pF ±10%	
Ci25,26	CQ93M1H682K	Mylar 0.0068μF ±10%	
Ci27,28	CQ93M1H103K	Mylar 0.01μF ±10%	
Ci29,30	CQ93M1H272K	Mylar 0.0027μF ±10%	
Ci31～34	CQ93M1H183K	Mylar 0.018μF ±10%	
Ci35,36	CE04W1E100	Electrolytic 10μF 25WV	
Ci37,38	CE04AW1H010M	Electrolytic 1μF 50WV	
Ci39,40	CE04AW1E4R7M	Electrolytic 4.7μF 25WV	
Ci41,42	CE04W1A101	Electrolytic 100μF 10WV	
Ci43,44	CQ93M1H123K	Mylar 0.012μF ±10%	
Ci45,46	CQ93M1H393K	Mylar 0.039μF ±10%	
Ci47	CE04W1E100	Electrolytic 10μF 25WV	
Ci48	CS15E1V0R1M	Tantalum 0.1μF 35WV	
Ci49～52	CK45B1H561K	Ceramic 560pF ±10%	
Ci53～56	CQ93M1H224K	Mylar 0.22μF ±10%	
		SEMICONDUCTOR	
Qi1,2	V03-0408-05	Transistor 2SC1222(U)	
	V03-0271-05	or 2SC1345(E)	
Qi3	V03-0270-05	Transistor 2SC945(P),(Q) or (R)	
	V03-0504-05	or 2SC828A(P),(Q) or (R)	
Qi4	V01-0084-05	Transistor 2SA733(P),(Q) or (R)	
	V01-0163-05	or 2SA564A(P),(Q) or (R)	
ICi1～4	V30-0140-05	IC TA7129P	
		POTENTIOMETER	
VRi1	R11-9005-05	Variable resistor 100kΩ(B) × 2, 200kΩ(W), VOLUME, BALANCE	
VRi2～4	R06-5013-05	Variable resistor 10kΩ(B) × 2 BASS, MID, TREBLE	

PARTS LIST

Ref. No.	Parts No.	Description	Re-marks
		SWITCH	
S13,14	S31-2039-05	Lever LOW-FIL, HIGH-FIL	
S20	S29-2018-05	Rotary, INPUT SELECTOR	

PUSH SWITCH (A) (X13-2190-10)

Ref. No.	Parts No.	Description	Re-marks
		CAPACITOR	
Cp1,2	CE04AW1H2R2MEL	Electrolytic 2.2μF 50WV	
		SEMICONDUCTOR	
Dp1,2	V11-0051-05	Diode 1N60	
Dp3,4	V11-0076-05	Diode 1S1555	
Dp5,6	V11-0051-05	Diode 1N60	
		POTENTIOMETER	
VRp1,2	R12-3028-05	Semi-fixed resistor 10kΩ(B) METER LEVEL	
		SWITCH	
S7,8	S40-2062-15	Pushbutton, DIMMER, METER	

TAPE MONITOR (X13-2310-10)

Ref. No.	Parts No.	Description	Re-marks
		CAPACITOR	
Cr1,2	CQ93M1H182J	Mylar 0.0018μF ±5%	
		POTENTIOMETER	
VRr1,2	R12-3014-05	Semi-fixed resistor 20kΩ(B) DOLBY FM	
		SWITCH	
S15	S01-6004-05	Rotary, TAPE MONITOR	
S16	S32-4007-05	Lever, TAPE MONITOR	
S17	S40-0002-05	Pushbutton, DOLBY FM	

SPEAKER SELECTOR (X13-2390-80)

Ref. No.	Parts No.	Description	Re-marks
		RESISTOR	
Rh1,2	RC05GF2H271K	Carbon 270Ω ±10% 1/2W	
		SWITCH	
S4～6	S42-3017-05	Pushbutton, SPEAKERS	
—	E40-0639-05	Pin connector (symmetry)	
—	E40-0640-05	Pin connector (non-symmetry)	

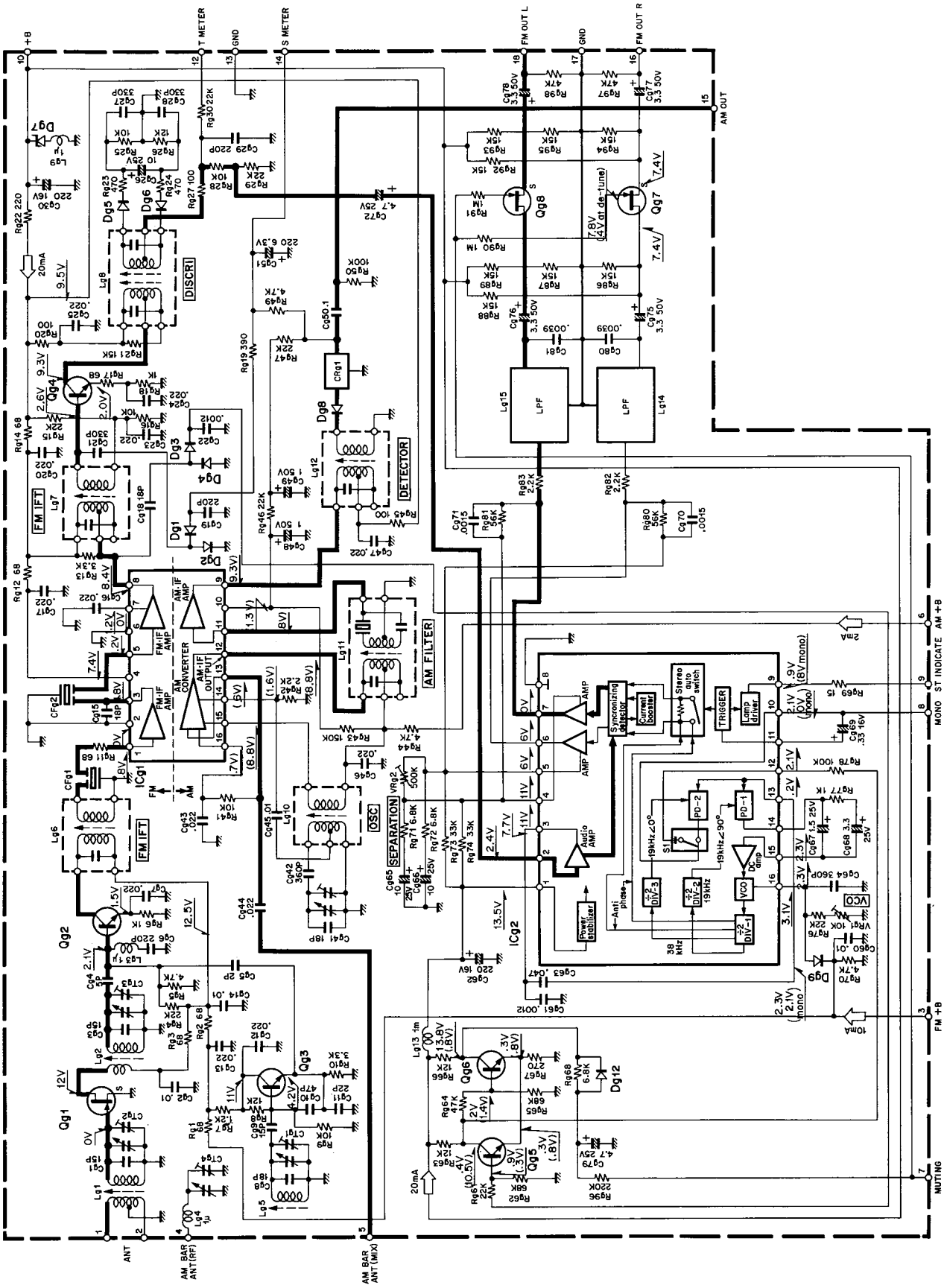
PUSH SWITCH (B) (X13-2430-80)

Ref. No.	Parts No.	Description	Re-marks
		CAPACITOR	
Cq1	CE04W1E101	Electrolytic 100μF 25WV	
Cq2	CQ93M1H104J	Mylar 0.1μF ±5%	
Cq3	CQ93M1H153J	Mylar 0.015μF ±5%	
Cq4	CQ93M1H273J	Mylar 0.027μF ±5%	
Cq5	CQ93M1H153J	Mylar 0.015μF ±5%	
Cq6,7	CQ93M1H273J	Mylar 0.027μF ±5%	
Cq8,9	CK45B1H471M	Ceramic 470μF ±20%	
Cq10	CE04W1C100	Electrolitic 10μF 16WV	
		RESISTOR	
Rq9	RC05GF125M	Carbon 1.2MΩ ±20%	1/2W
		SEMICONDUCTOR	
Qq1,2	V03-0271-05	Transistor 2SC1345(E) or (F)	
		POTENTIOMETER	
VRq1	R12-1027-05	Semi-fixed resistor 2kΩ(B) 400 Hz, LEVEL	
		SWITCH	
S9～12	S40-4019-15	Pushbutton	

DOLBY (X14-1070-10)

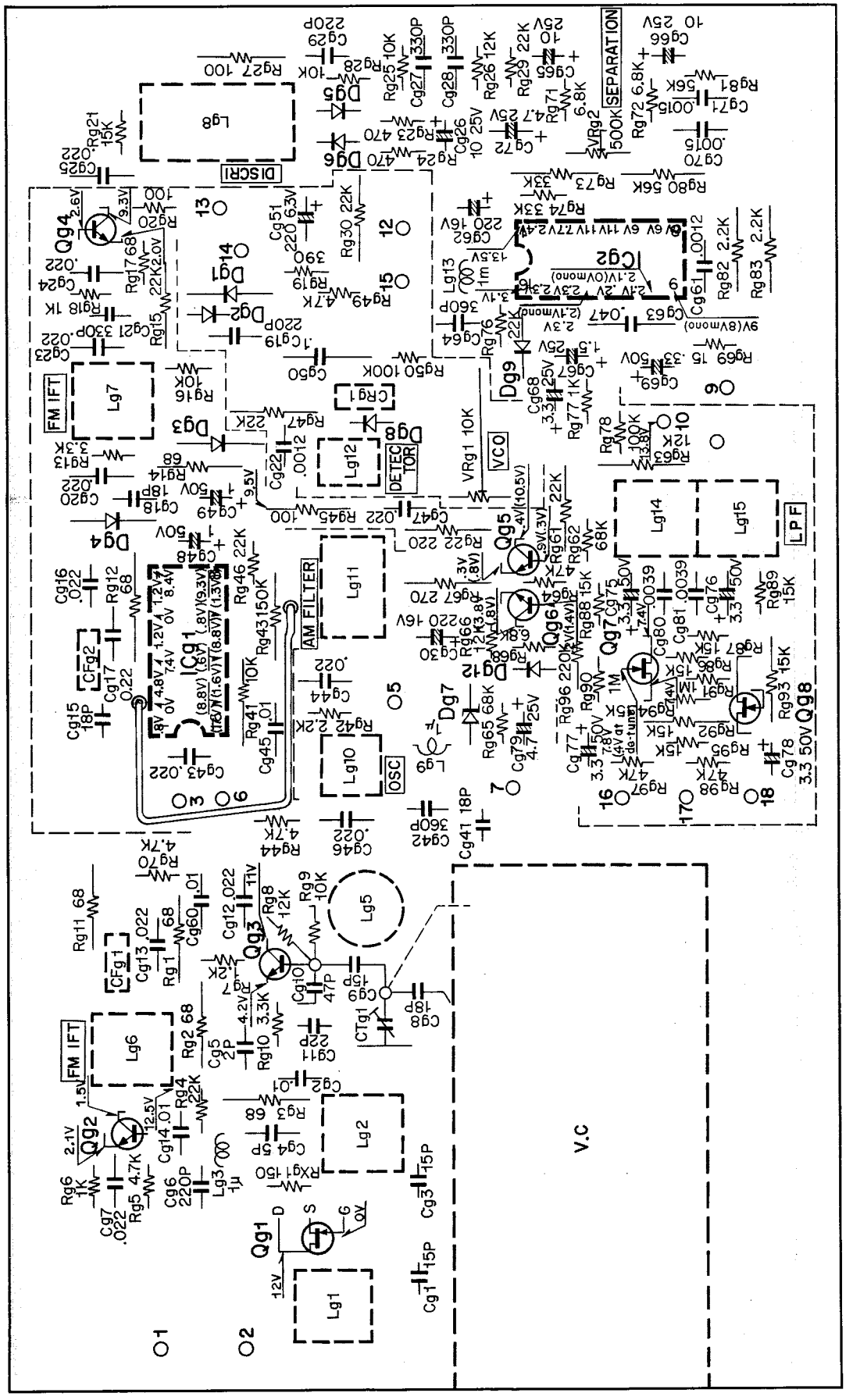
Ref. No.	Parts No.	Description	Re-marks
		CAPACITOR	
Cv1,2	CS15E1E010M	Tantalum 1μF 25WV	
Cv3,4	CQ93N1H272J	Mylar 0.0027μF ±5%	
Cv5,6	CQ93M1H102J	Mylar 0.001μF ±5%	
Cv7～10	CE04W1E100	Electrolytic 10μF 25WV	
Cv11,12	CQ93M1H562G	Polyester 0.0056μF ±2%	
Cv13,14	CE04W1E100	Electrolytic 10μF 25WV	
Cv15,16	CQ93M1H334J	Mylar 0.33μF ±5%	
Cv17,18	CQ93M1H104J	Mylar 0.1μF ±5%	
Cv19,20	CQ93M1H473J	Mylar 0.047μF ±5%	
Cv21,22	CE04W1E100	Electrolytic 10μF 25WV	
Cv23,24	CQ93M1H472G	Polyester 0.0047μF ±2%	
Cv25,26	CE04W1E100	Electrolytic 10μF 25WV	
Cv27,28	CE04W1C221	Electrolytic 220μF 16WV	
C29,30	CQ93M1H273G	Polyester 0.027μF ±2%	
Cv31,32	CE04W1H010	Electrolytic 1μF 50WV	
Cv33,34	CE04W1E100	Electrolytic 10μF 25WV	
Cv35	CE04W1E101	Electrolytic 100μF 25WV	
		RESISTOR	
Rv31	RC05GF2H151K	Carbon 150Ω ±10% 1/2W	
		SEMICONDUCTOR	
Qv1,2	V03-0270-05	Transistor 2SC945(R) or (Q)	
ICv1,2	V30-0139-05	IC NE545B	
Dv1～4	V11-0051-05	Diode 1N60	
		POTENTIOMETER	
VRv1,2	R12-1007-05	Semi-fixed resistor 1kΩ(B) METER, CAL	
		INDUCTOR	
Lv1,2	L39-0041-05	Variable	

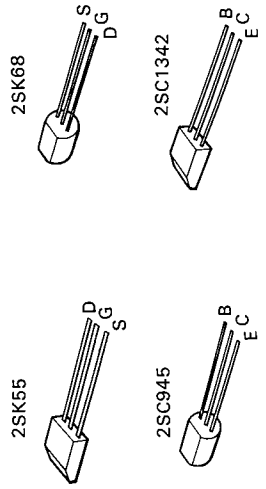
TUNER (X05-1390-10)



DC voltages are measured with 20kΩ/V meter at stereo signal reception except ( ).
( ) voltages are measured at AM reception.

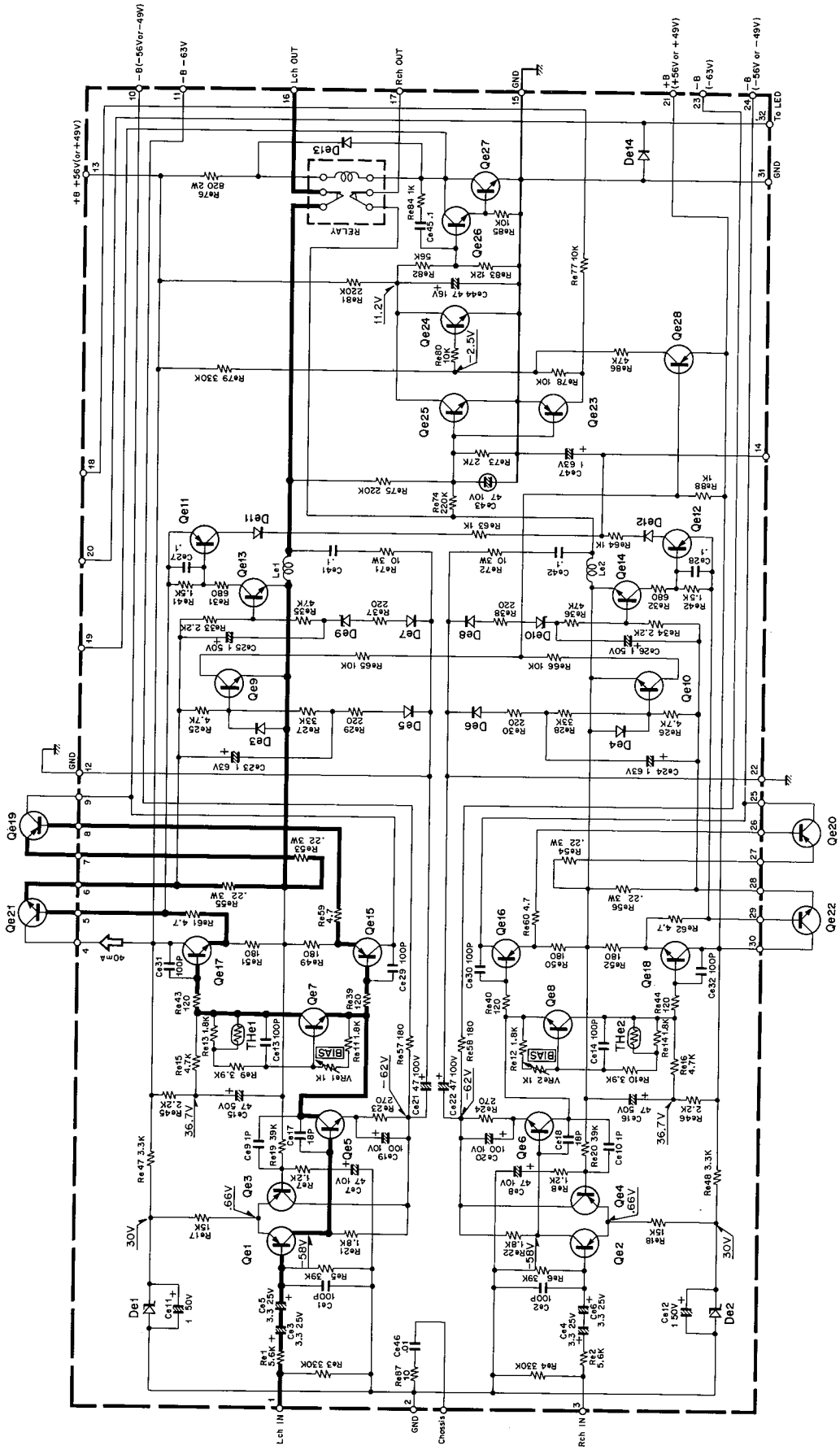
TUNER (X05-1390-10)





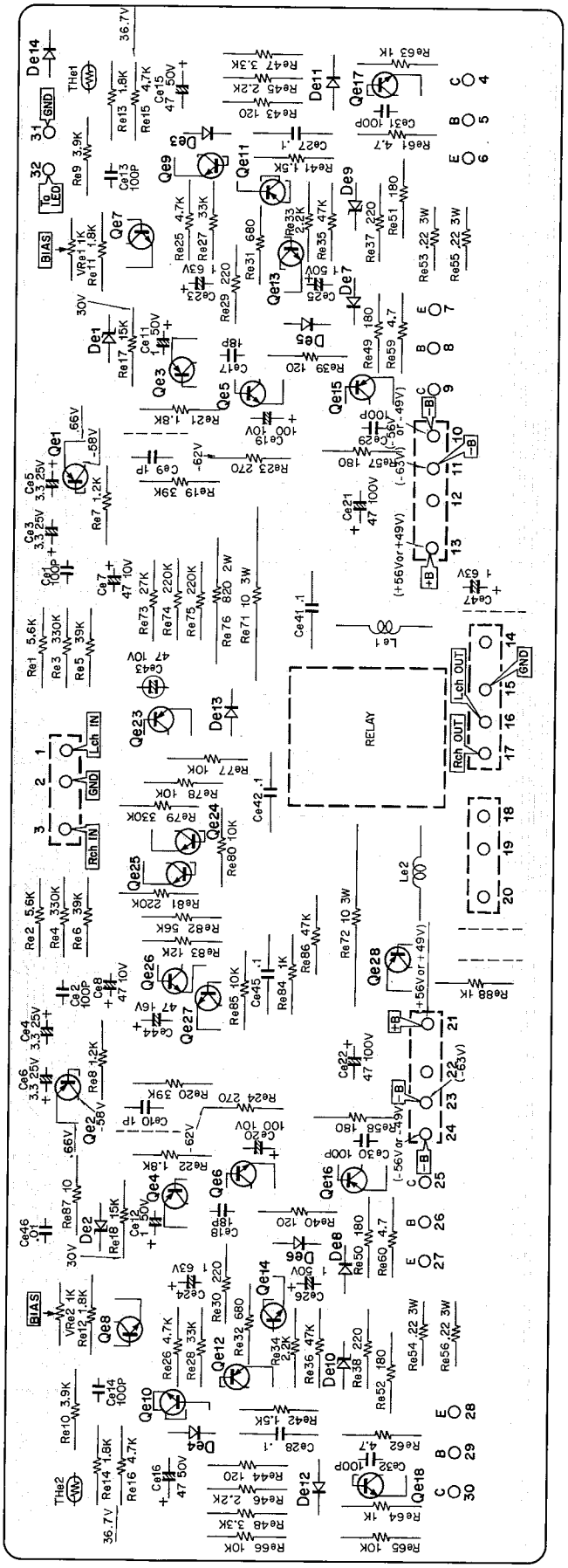
Qg1 : 2SK55 (D) or (E), Qg2 : 2SC381 (O), Qg3 : 2SC1342 (A), Qg4 : 2SC381 (R), Qg5, 6 : 2SC945,
Qg7, 8 : 2SK68 (L) or (M) or 2SK30A (Y) or (Gr), ICg1 : AN-217BB, ICg2 : HA-1196,
Dg1 ~ 4, 8 : 1N60, Dg5, 6, 9, 12 : 1S2076 or 1S1555, Dg7 : XZ-137

POWER AMP (X07-1570-80)

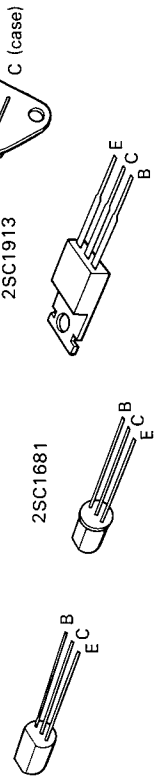


DC voltages are measured with 20kΩ/V meter at no signal fed condition.

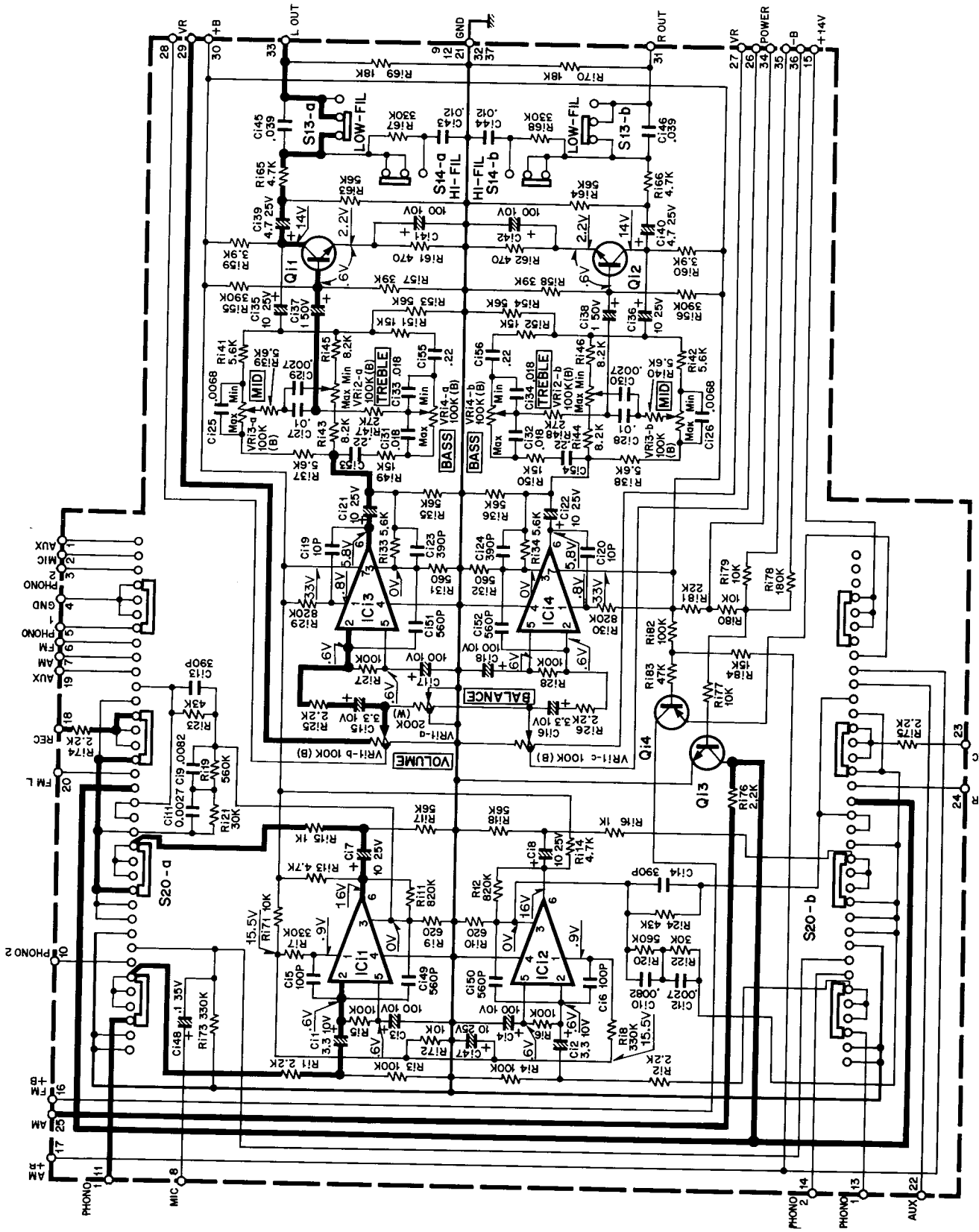
POWER AMP (X07-1570-80)



Qe1 ~ 4 : 2SA872 (D) or (E), Qe5, 6 : 2SC1885 (Q) or (R), Qe7, 8, 26 : 2SC1890 (D), (E) or (F) or 2SC1681 (GR) or (BL), Qe9, 10 : 2SC1890A (D), (E) or (F), Qe11, 12, 28 : 2SA893 (D), (E) or (F), or 2SA750 (E) or (U), Qe13, 14, 24, 25 : 2SC945 (Q) or (R) or 2SC828A (Q) or (R), Qe15, 16 : 2SA913 (Q) or (R), Qe17, 18 : 2SC1913 (Q) or (R), Qe19, 20 : 2SA747 (O) or (Y), Qe21, 22 : 2SC1116 (O) or (Y), Qe23 : 2SA733 (Q) or (R) or 2SA564A (Q) or (R), Qe27 : 2SD438MP (D) or (E) or 2SC1735 (D) or (E).
De1, 2 : WZ-300, De3, 4, 14 : 1S2076, De5 ~ 8, 11, 12 : 1S2076A,
De9, 10 : WZ-140, De13 : W06B, THe1, 2 : 5TP-41L

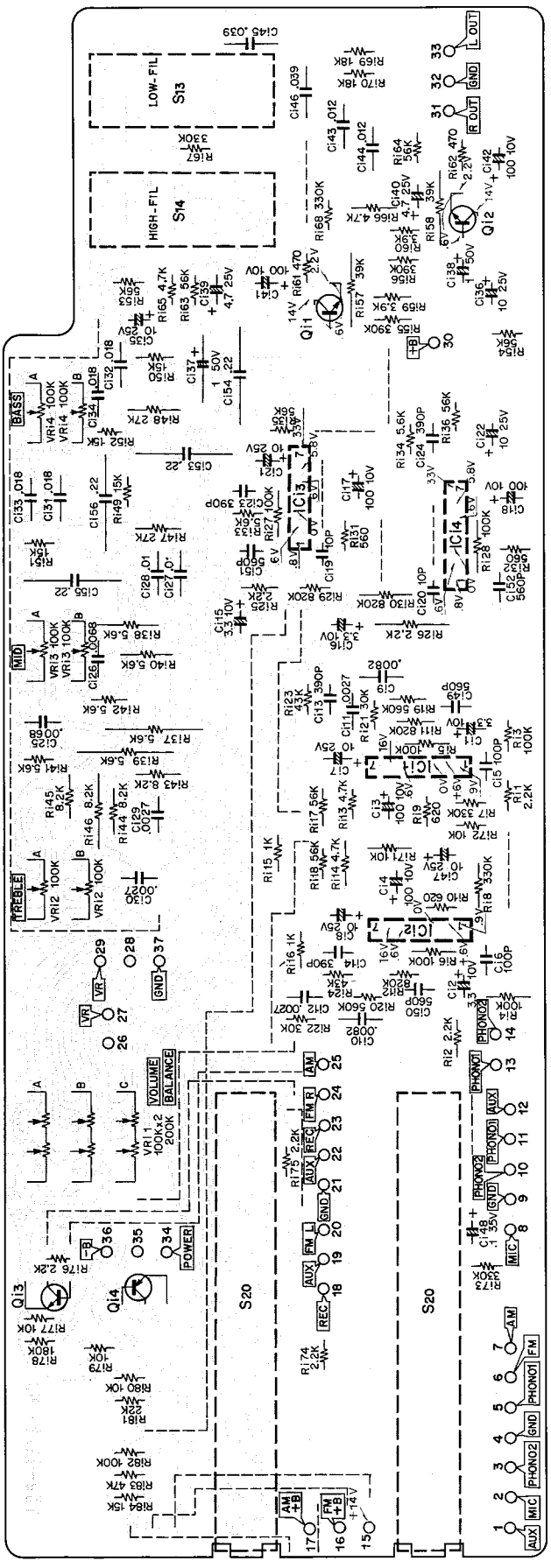


CONTROL AMP (X11-1440-10)

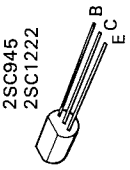


DC voltages are measured with 20kΩ/V meter at no signal fed condition.

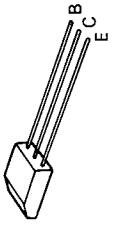
CONTROL AMP (X11-1440-10)



2SA564A
2SA733
2SC828A
2SC945
2SC1222



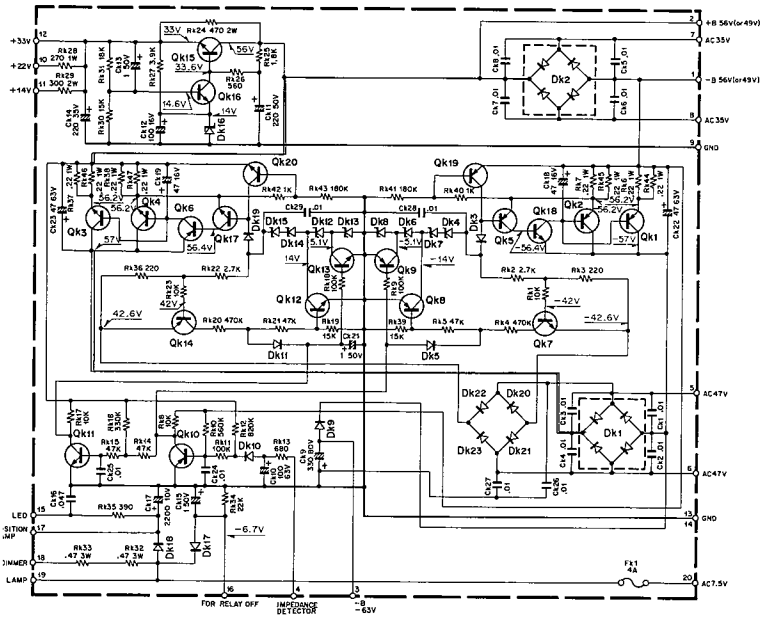
2SC1345

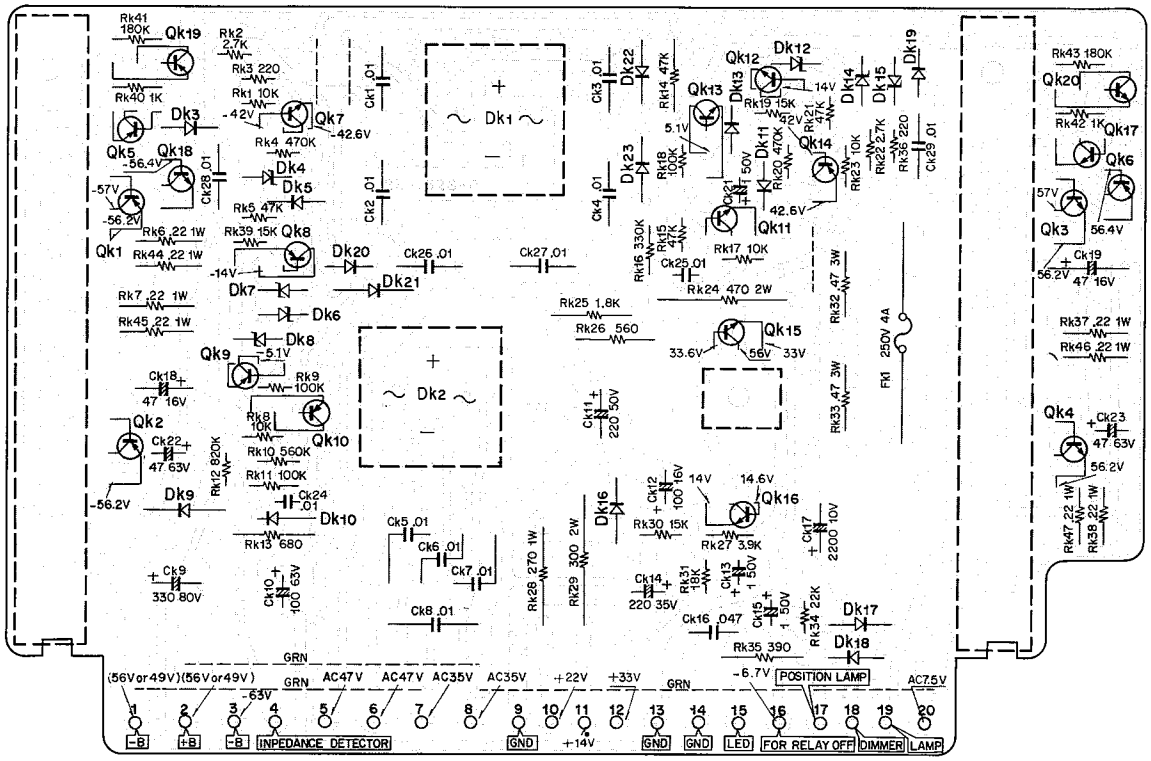


ICi1 ~ 4 : TA7129P. Qi1, 2 : 2SC1222 (U) or 2SC1345 (E). Qi3 : 2SC945 (P) or (Q) or (R) or 2SC828A (P) or (Q) or (R).
Qi4 : 2SA733 (P) or (Q) or (R) or 2SA564A (P) or (Q) or (R)

POWER SUPPLY (X00-1930-80)

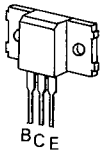
DC voltages are measured with 20kΩ/V meter at no signal fed condition.



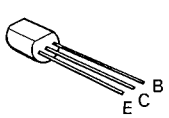


Qk1, 2 : 2SB616 (Q), (R) or (S), Qk3, 4 : 2SC586 (Q), (R) or (S), Qk5, 10, 14, 19 : 2SA893 (D), (E) or (F) or 2SA750 (1) (E) or (U), Qk6 : 2SB596 (R), (O) or (Y), Qk7, 11, 16, 17, 20 : 2SC1890 (D), (E) or (F) or 2SC1400 (E) or (U), Qk8, 9 : 2SA733 (Q) or (R) or 2SA564A (Q) or (R), Qk12, 13 : 2SC945 (Q) or (R) or 2SC828A (Q) or (R), QK15 : 2SD330 (D), (E) or (F) or 2SC1419 (B) or (C), Qk18 : 2SD526 (R), (O) or (Y), Dk1, 2 : M4C-5 (S), Dk3, 5, 10, 11, 17, 19 : 1S2076A, Dk4, 6, 7, 12, 14, 15 : XZ-147, Dk8, 13 : WZ-120, Dk9, 18 : W06B, Dk16 : WZ-140, Dk20 ~ 23 : V06C

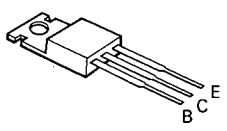
2SB616
2SD586



2SA564A
2SA733
2SA750
2SA893
2SC828A
2SC945
2SC1400
2SC1890

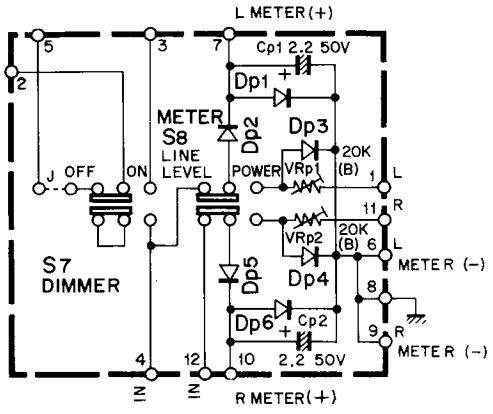


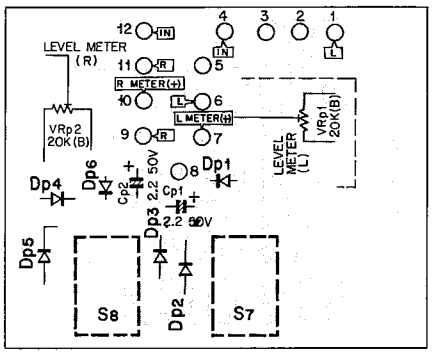
2SB596
2SC1419
2SD330
2SD526



PUSH SWITCH(A)/SPEAKER SELECTOR/TAPE MONITOR

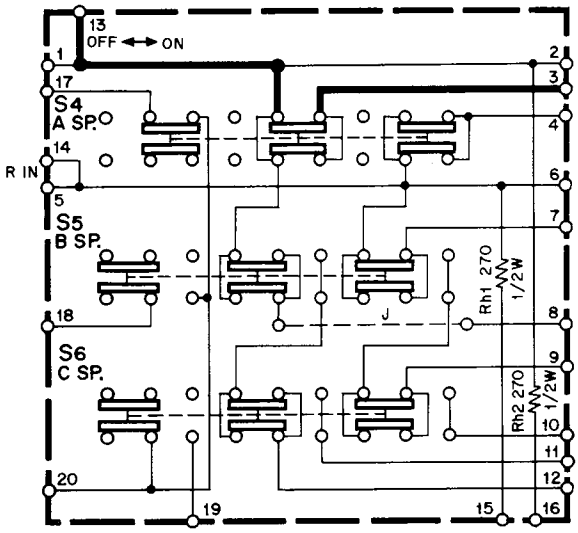
PUSH SWITCH (A) (X13-2190-10)

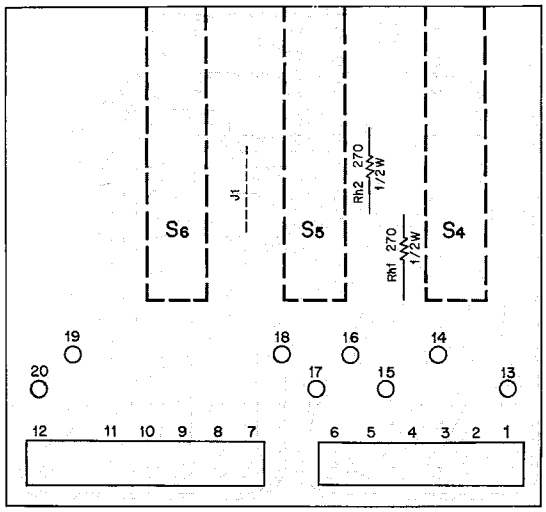




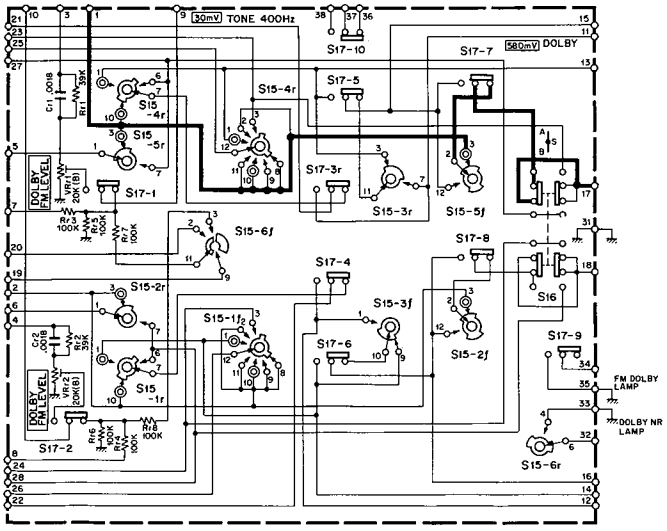
Dp1, 2, 5, 6 : 1N60, Dp3, 4 : 1S1555

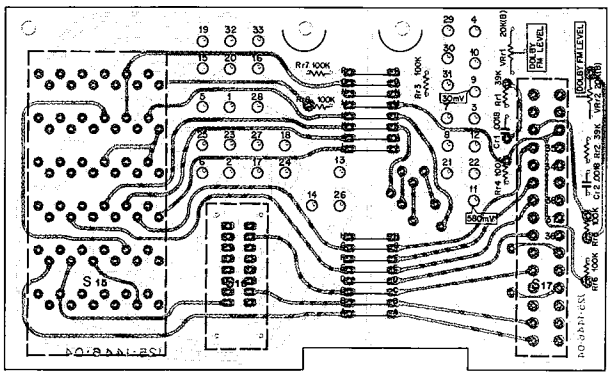
SPEAKER SELECTOR (X13-2390-80)





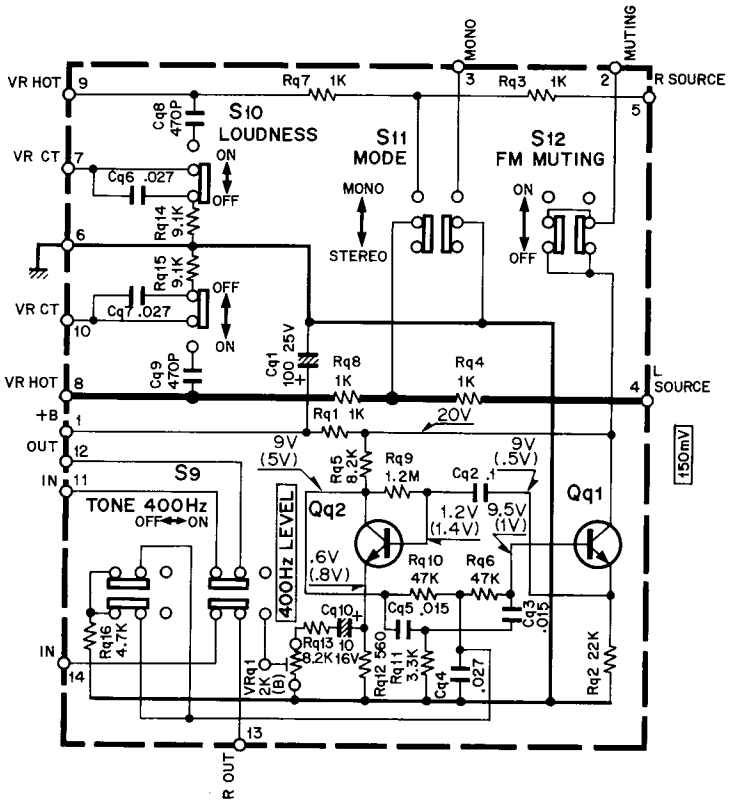
TAPE MONITOR (X13-2310-10)

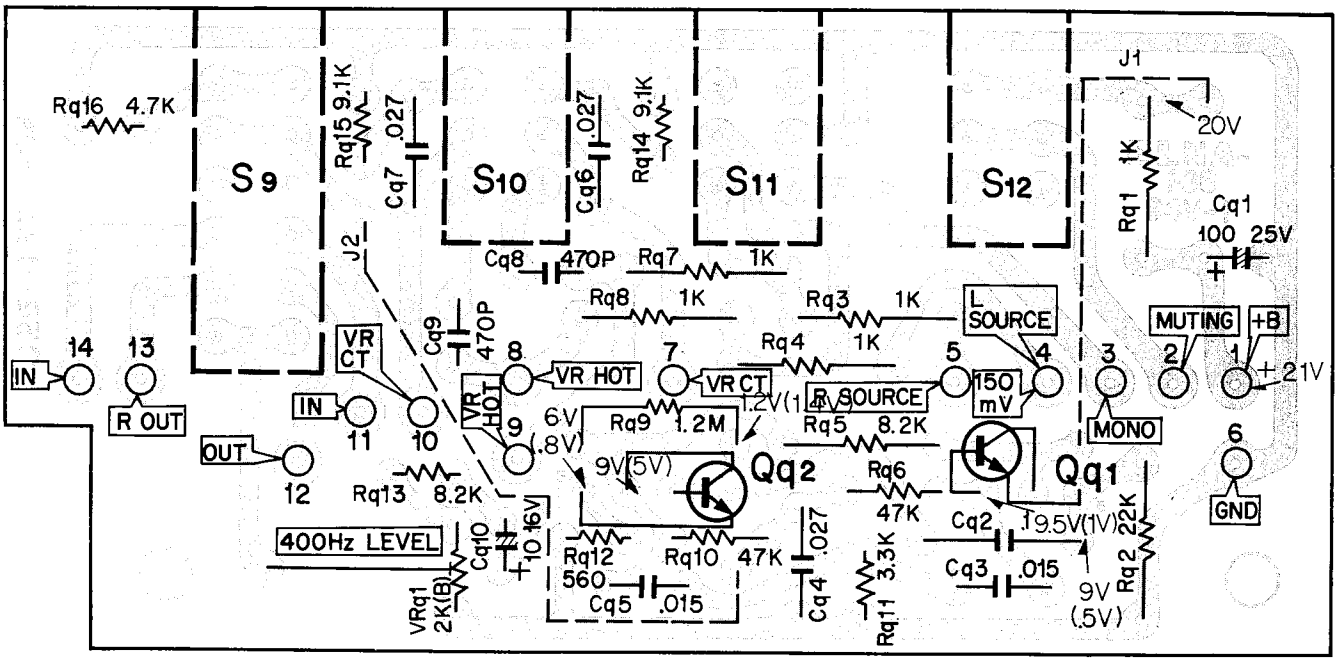




PUSH SWITCH(B) (X13-2430-80)

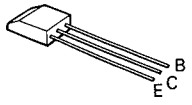
DC voltages are measured with 20kΩ/V meter at no signal fed condition.





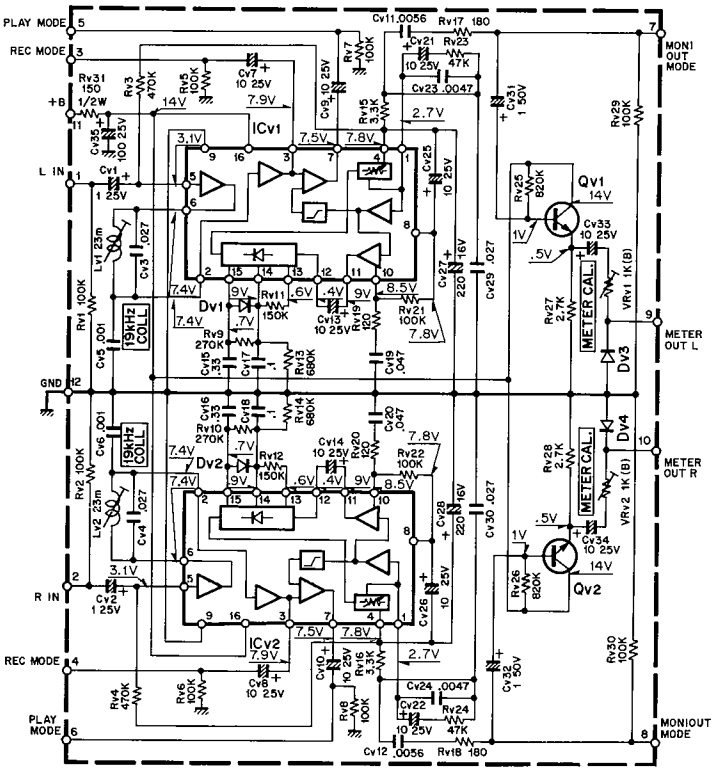
Qq1, 2 : 2SC1345 (E) or (F)

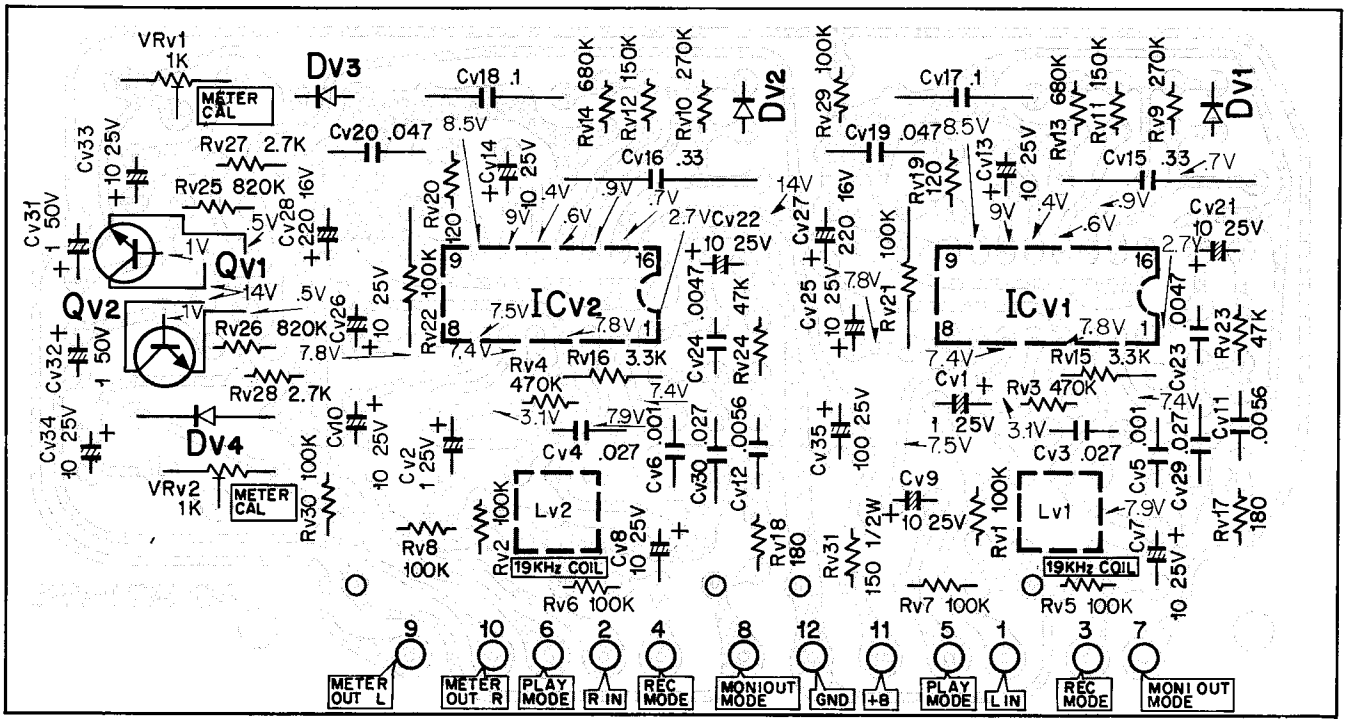
2SC1345



DOLBY (X14-1070-10)

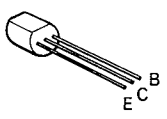
DC voltages are measured with 20kΩ/V meter at no signal fed condition.





Qv1, 2 : 2SC945 (R) or (Q), ICv1, 2 : NE545B

2SC945



ADJUSTMENTS

No.	ALIGN	TEST EQUIPMENTS		RECEIVER SETTING	OUTPUT INDICATOR	ADJUSTMENT POINTS	REMARKS
		CONNECTION	SETTING				
FM SECTION							
1	IF	Ⓐ and Ⓑ	95 MHz (60 dB) 1 kHz (Mod) 75 kHz (Dev)	95 MHz	SSVM & scope to REC jack	Lg6, 7	Maximum deflection
2		—	—	—	T meter	Lg8 (primary)	Make the pointer position in the center of the meter
3		Ⓐ and Ⓑ	95 MHz (60 dB) 1 kHz (Mod) 75 kHz (Dev)	95 MHz	SSVM, scope & distortion meter to REC jack (L)	Lg8 (secondary)	Maximum deflection and minimum distortion
4	OUTPUT	ditto	95 MHz 1 kHz (Mod) 75 kHz (Dev) 60 dB (input)	95 MHz	ditto	—	Confirm output voltage is 700 mV
5	TRACKING	ditto	90 MHz 1 kHz (Mod) 75 kHz (Dev)	90 MHz	ditto	Lg1, 2, 5	Maximum deflection
6			108 MHz 1 kHz (Mod) 75 kHz (Dev)	108 MHz		CTg1～3	
7	VCO	Ⓐ	95 MHz 0 (Dev) 60 dB (Input)	95 MHz	Freq. counter via 20～30 dB amp*1 or SSVM to TP1	VRg1	Counter indicates 76 kHz
8	DISTORTION	Ⓑ and Ⓒ	95 MHz 1 kHz (Mod) 68.25 kHz (Dev) L (Select) 60 dB (Input)	98 MHz	SSVM, scope & distortion meter to REC jack (L)	Lg6, 7	Minimum distortion
AM SECTION							
1	IF	Ⓑ and Ⓓ	1000 kHz 400 Hz, 30% (Mod) 100 dB	1000 kHz	SSVM & scope to REC jack (L)	Lg11, 12	Maximum deflection
2	TRACKING	ditto	600 kHz 400 Hz, 30% (Mod) 100 dB	600 kHz	ditto	Lg10 Bar antenna	ditto
3			1400 kHz 400 Hz, 30% (Mod)	1400 kHz		CTg4, 5	
AUDIO SECTION							
1	BIAS	—	—	VOLUME is its min.	DC volt meter or BIAS current meter (B31-0125-05)	VRe1, 2	Meter indicates*2 90 mV
2	POWER METER	Ⓔ and Ⓕ	1 kHz	RMS output voltage is 2.8V/8Ω METER POWER	POWER/ LINE LEVEL METER	VRp1, 2	Meter indicates*3 1W
DOLBY NR SECTION							
1	400 Hz OSC. CAL.	—	—	S9: ON S15: PLAY A▶B PLAY CAL VR: MAX REC LEVEL VR: MAX METER: LEVEL	SSVM to B REC jack Ⓖ	VRq1	Output is 580 mV
2	METER CAL.	—	—	Same	POWER/ LINE LEVEL METER	VRv1, 2	Meter points*4 Cal.
3	19 kHz COIL	Ⓗ and Ⓖ	19 kHz 1V	S9: OFF S15: PLAY A▶B PLAY CAL VR: MAX REC LEVEL VR: MAX	SSVM to B REC jack	Lv1, 2	Output is min.
4	DOLBY FM	Ⓐ and Ⓖ	95 MHz 37.5 kHz (Dev) 1 kHz (Mod) 1mV (60 dB input)	S9: OFF S17: ON S15: PLAY A▶B	Same	VRr1, 2	Output is 580 mV

ADJUSTMENTS

TEST EQUIPMENT and its SPECIFICATIONS

STANDARD SIGNAL GENERATOR (RF-SG)

Ranges:	90 MHz～108 MHz (FM) 500 kHz～1600 kHz (AM)
Modulation frequency:	1 kHz, 400 Hz or external input (input level 2V or less)
Deviation:	0～75 kHz (FM)
Modulation:	0～30% (AM)
Output:	100 mV or more
Distortion:	0.5% or less

SOLID STATE VOLT METER (SSVM)

Ranges:	0.3 mV～300V (full scale)
Frequency response:	5 Hz～500 kHz
Impedance:	1MΩ or more

OSCILLOSCOPE (SCOPE)

Ranges:	DC ～10 MHz
Sensitivity:	20 mV/cm
Impedance:	1MΩ or more

DISTORTION METER

Ranges:	0.1% (full scale)
Sensitivity:	100 mV or more

FREQUENCY COUNTER (COUNTER)

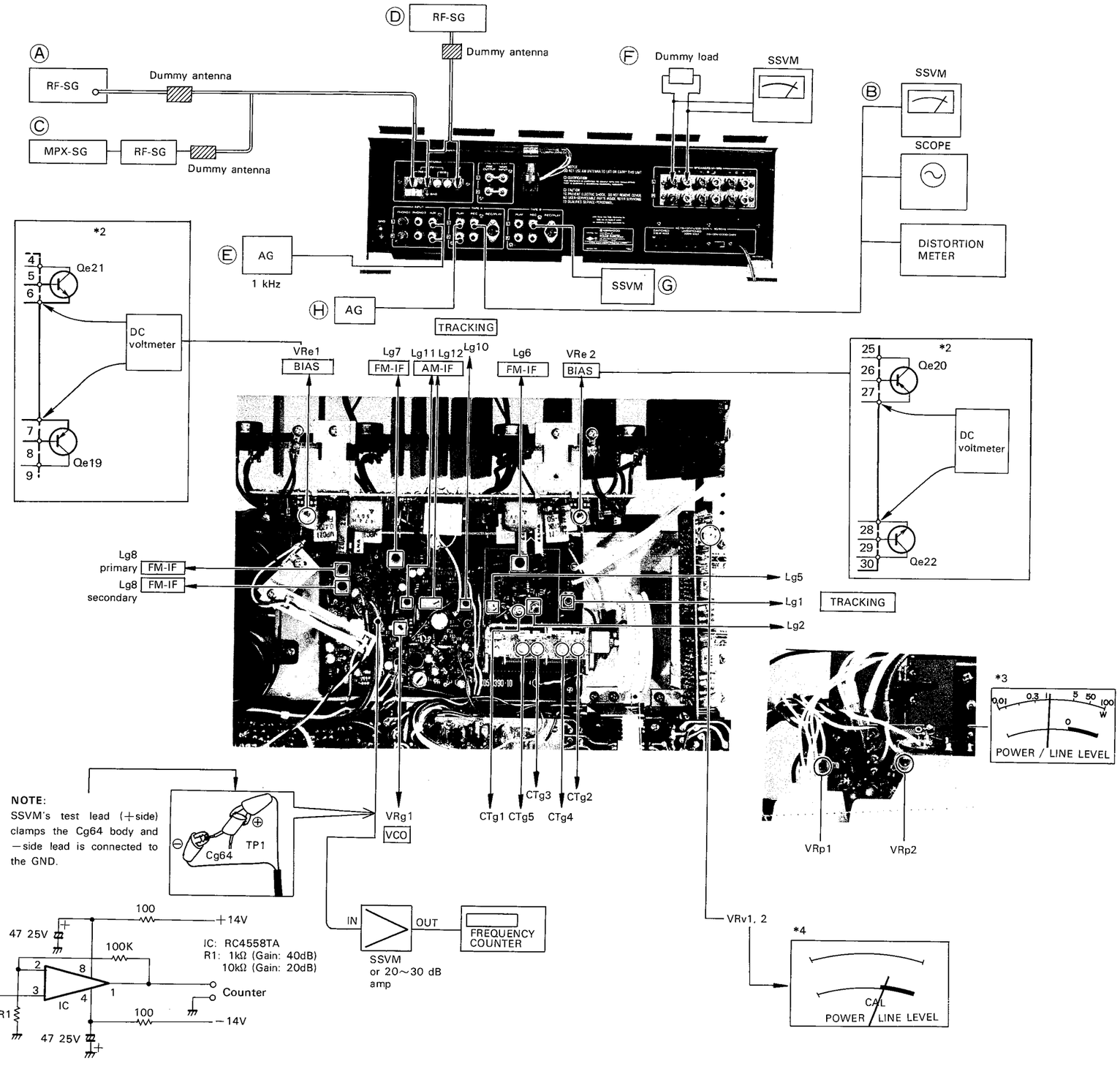
Frequency response:	10 Hz～1 MHz
Sensitivity:	50 mV or more
Impedance:	1MΩ or more

AUDIO SIGNAL GENERATOR (AG)

Ranges:	5 Hz～500 kHz
Waveform:	Sine wave
Output:	10V r.m.s.
Distortion:	0.3% or less

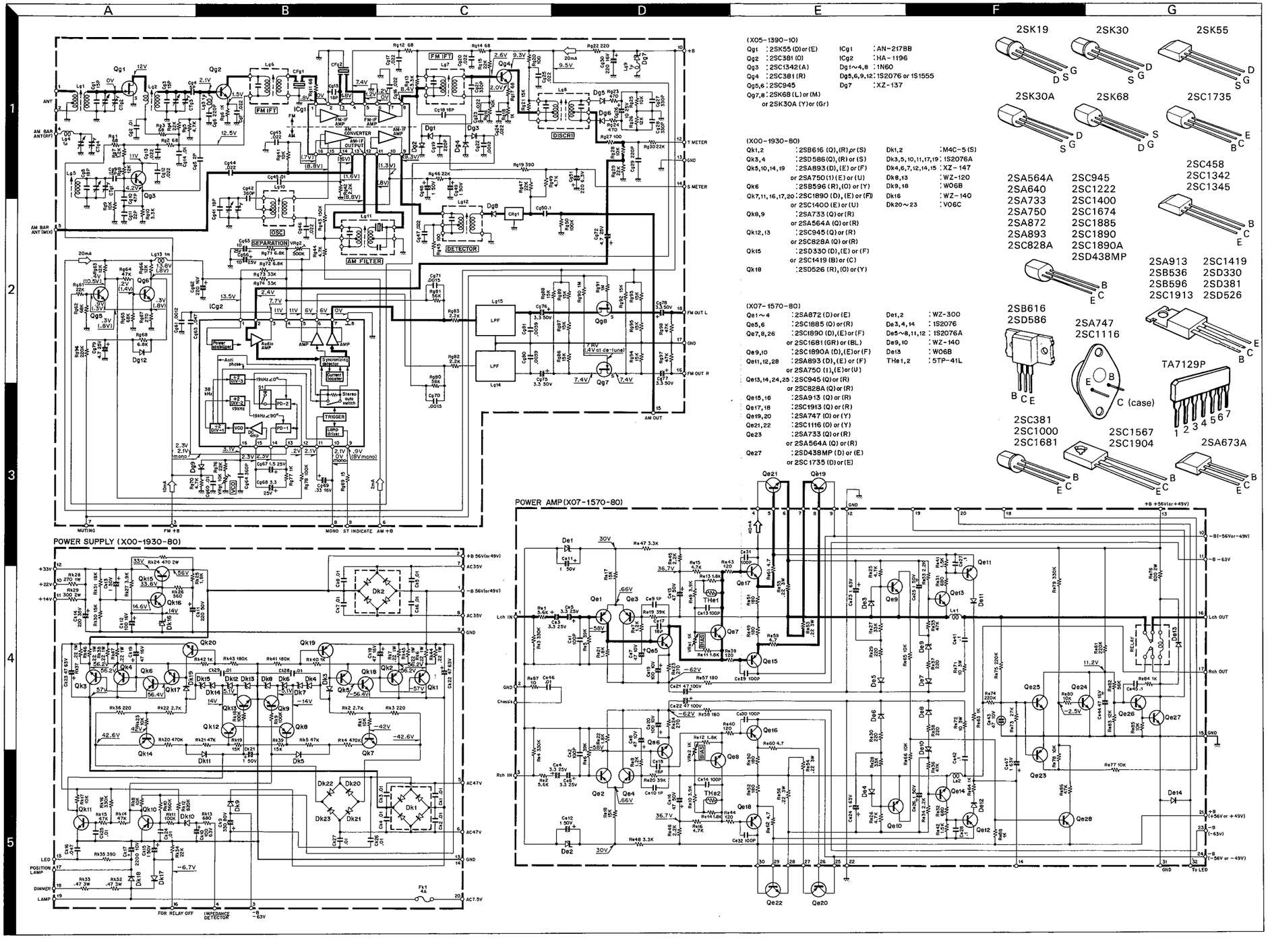
NOTE:

* RF-SG is set to the lowest response possible on oscilloscope.
* The output level of RF-SG is made a loss by the dummy antenna. The loss is different from the dummy antenna, so you should take into consideration the value of the loss applicable to your case.
* Repeat TRACKING adjustment several times and confirm the reception of broadcasting.
* Test point is shown in the schematic diagram.



MODEL ELEVEN III MODEL ELEVEN III

SCHEMATIC DIAGRAM (1)



(X05-1390-10)

Qg1	: 2SK55 (D) or (E)	ICg1	: AN-217BB
Qg2	: 2SC381 (O)	ICg2	: HA-1196
Qg3	: 2SC1342 (A)	Dg1~4,8	: 1N60
Qg4	: 2SC381 (R)	Dg5,6,9,12	: 1S2076 or 1S1555
Qg5,6	: 2SC945	Dg7	: XZ-137
Qg7,8	: 2SK68 (L) or (M) or 2SK30A (Y) or (Gr)		

(X00-1930-80)

Qk1,2	: 2SB616 (Q),(R) or (S)	Dk1,2	: M4C-5 (S)
Qk3,4	: 2SD586 (Q),(R) or (S)	Dk3,5,10,11,17,19	: 1S2076A
Qk5,10,14,19	: 2SA893 (D),(E) or (F) or 2SA750 (1) (E) or (U)	Dk4,6,7,12,14,15	: XZ-147
Qk6	: 2SB596 (R),(O) or (Y)	Dk8,13	: WZ-120
Qk7,11,16,17,20	: 2SC1890 (D),(E) or (F) or 2SC1400 (E) or (U)	Dk9,18	: W06B
Qk8,9	: 2SA733 (Q) or (R) or 2SA564A (Q) or (R)	Dk16	: WZ-140
Qk12,13	: 2SC945 (Q) or (R) or 2SC828A (Q) or (R)	Dk20~23	: V06C
Qk15	: 2SD330 (D),(E) or (F) or 2SC1419 (B) or (C)		
Qk18	: 2SD526 (R),(O) or (Y)		

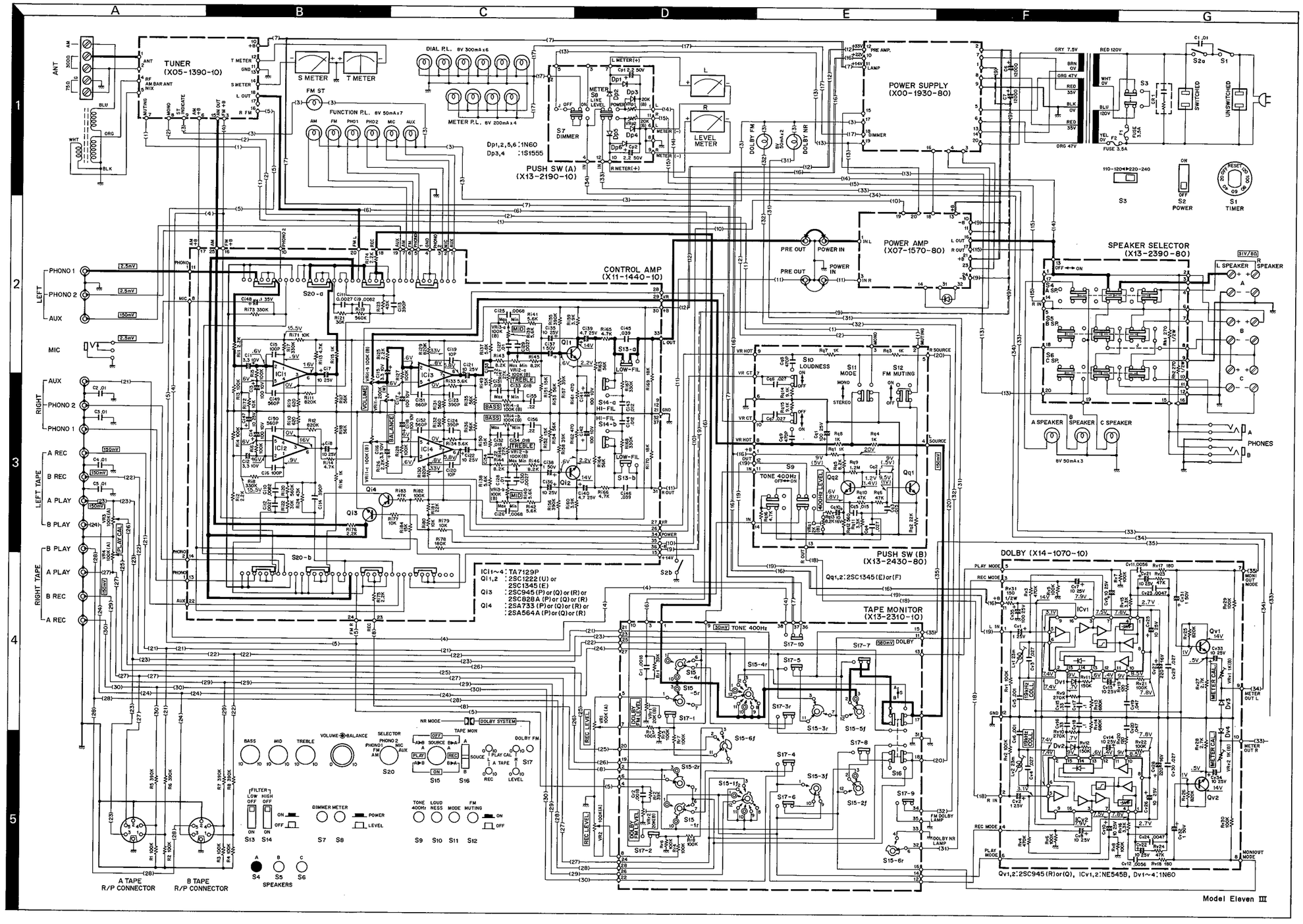
(X07-1570-80)

Qe1~4	: 2SA872 (D) or (E)	De1,2	: WZ-300
Qe5,6	: 2SC1885 (Q) or (R)	De3,4,14	: 1S2076
Qe7,8,26	: 2SC1890 (D),(E) or (F) or 2SC1681 (GR) or (BL)	De5~8,11,12	: 1S2076A
Qe9,10	: 2SC1890A (D),(E) or (F)	De9,10	: WZ-140
Qe11,12,28	: 2SA893 (D),(E) or (F) or 2SA750 (1),(E) or (U)	De13	: W06B
Qe13,14,24,25	: 2SC945 (Q) or (R) or 2SC828A (Q) or (R)	THe1,2	: 5TP-41L
Qe15,16	: 2SA913 (Q) or (R)		
Qe17,18	: 2SC1913 (Q) or (R)		
Qe19,20	: 2SA747 (O) or (Y)		
Qe21,22	: 2SC1116 (O) or (Y)		
Qe23	: 2SA733 (Q) or (R) or 2SA564A (Q) or (R)		
Qe27	: 2SD438MP (D) or (E) or 2SC1735 (D) or (E)		

SEMICONDUCTOR NAME	SUBSTITUTIONS
POWER SUPPLY (X00-1930-80)	
2SA733	2SA564A, 2SA640
2SA893	2SA750, 2SA893A
2SB596	2SB595
2SB616	2SB618
2SC945	2SC828A, 2SC458
2SC1890	2SC1400, 2SC1890A
2SD330	2SC1419, 2SC1061
2SD526	2SD525
2SD586	2SD588
TUNER (X05-1390-10)	
2SC381	2SC1674
2SC945	2SC458, 2SC828
2SC1342	—
2SK55	2SK19
2SK68	2SK30
AN217BB	—
HA1196	—
POWER AMP (X07-1570-80)	
2SA733	2SA564A, 2SA640
2SA747	2SA747A
2SA872	2SA872A
2SA893	2SA750, 2SA893A
2SA913	2SB536 (2)
2SC945	2SC828A, 2SC1000, 2SC1345
2SC1116	2SC1116A
2SC1885	2SC1904
2SC1890	2SC1681, 2SC1890A
2SC1890A	—
2SC1913	2SD381 (2)
2SD438MP	2SC1735
CONTROL AMP	
2SA733	2SA640, 2SA673, 2SA564A
2SC945	2SC828A, 2SC458
2SC1222	2SC1345, 2SC1400
PUSH SWITCH (B) (X13-2430-80)	
2SC1345	2SC1000
DOLBY (X14-1070-10)	
2SC945	2SC458, 2SC828
NE545B	—

* DC voltages are measured with 20kΩ/V meter at no signal except tuner section.
* For tuner section, DC voltages are measured with 20kΩ/V meter at FM reception except ( ).
* ( ) voltages are measured at AM reception.

SCHEMATIC DIAGRAM (2)



DC voltages are measured with 20kΩ/V meter at no signal.

MODEL ELEVEN III

SPECIFICATIONS

POWER AMPLIFIER SECTION

120 watts per channel minimum RMS at 8 ohms, from 20 Hz to 20,000 Hz with no more than 0.1% total harmonic distortion.

Both Channel Driven	135+135 watts into 4 ohms at 1,000 Hz
Dynamic Power Output	320 watts into 8 ohms
Total Harmonic Distortion	0.1% at rated power into 8 ohms
(from AUX)	0.05% at 1 watt into 8 ohms at 1,000 Hz
Inter Modulation Distortion	0.1% at rated power into 8 ohms
(60 Hz, 7,000 Hz = 4:1)	0.05% at 1 watt into 8 ohms
Power Band Width	10 Hz to 50,000 Hz
Frequency Response	10 Hz to 100,000 Hz −1.0 dB
Damping Factor	60 at 8 ohms
Speaker Impedance	Accept 4 ohms to 16 ohms
Input Impedance	50k ohms
Input Sensitivity	1V

PRE-AMPLIFIER SECTION

Input Sensitivity, Impedance and S/N (IHF A curve)

Phono 1	2.5 mV, 50k ohms, 80 dB
Phono 2	2.5 mV, 50k ohms, 80 dB
AUX	150 mV, 50k ohms, 100 dB
Tape Play A, B	150 mV, 50k ohms, 100 dB
Mic	2.5 mV, 50k ohms, 75 dB

Output Voltage and Impedance

Tape Rec. (Pin)	A: 150 mV, 100 ohms,
	B: 150 mV, 100 ohms
(DIN)	A: 30 mV, 80k ohms,
	B: 120 mV, 80k ohms
Pre Out	1V 1k ohms

Frequency Response

Phono 1, 2	RIAA Standard curve ±0.5 dB
AUX, Tape Play	20 Hz to 40,000 Hz −1.0 dB

Tone Controls

Bass	±10dB at 100 Hz
MID	±10 dB at 800 Hz
Treble	±10 dB at 10 kHz
Loudness (−30dB)	+10 dB at 100 Hz
	+5 dB at 10 kHz
Low Filter	−9 dB at 100 Hz
High Filter	−9 dB at 10 kHz

FM TUNER SECTION (IHF)

Usable Sensitivity	10.3 dBf (1.8μV)
50 dB Quieting	17.3 dBf (4.0μV)
Signal to Noise Ratio at 65dBf	75 dB
Harmonic Distortion at 65dBf	0.2% (MONO)
	0.4% (STEREO)
Image Response Ratio	60 dB
Alternate Channel Selectivity	60 dB
IF Response Ratio	100 dB
Capture Ratio	1.5 dB
Spurious Response Ratio	80 dB
AM Suppression Ratio	55 dB
Stereo Separation	40 dB at 1,000 Hz
	35 dB at 50 Hz to 10,000 Hz
Antenna Impedance	300 ohms Balanced and
	75 ohms Unbalanced

AM TUNER SECTION

Usable Sensitivity	20μV
Signal to Noise Ratio	50 dB at 1 mV input
Image Rejection	50 dB
Selectivity	30 dB
IF Rejection	35 dB
Antenna	Built-in ferrite bar antenna, External antenna terminal

GENERAL

Switches

Speaker Selector	A,B,C,A+B,A+C,B+C,A+B+C
Input Selector	AM—FM—PHONO 1—PHONO 2 —MIC—AUX
Input Selector	Tape Selector (Tape A—Source—Tape B)
Mode	MONO—STEREO
Meter	Power—Line Level (Dolby NR Cal.)
Tape Monitor	A—Source—B
Dolby NR Mode	Play—Off—Rec.
Other Switches	Dolby FM, 400 Hz Tone, FM Muting, Loudness, High Flit, Low Filter, Dimmer, Power

Special Functions

2-Hour Shut-off Timer, Dolby NR System, 2 Power Meters, Triple Tone Controls, 2 Headphones, Selector Indicator

AC Outlet	Switched 1, Unswitched 1
Power Consumption	590 watts at full power
Power Requirement	50/60 Hz 110—120, 220—240V
Dimensions	W: 22-19/32″ (574 mm)
	H: 7-3/4″ (198 mm)
	D: 14-3/4″ (375 mm)
Weight (Net)	39.7 lbs. (18 kg)

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